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INFANTILE RICKETS

ITS OCCURRENCE IN NON-EUROPEANS IN JOHANNESBURG

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There is a very widely-held belief among both the medical profession and the public that rickets does not occur to any extent in South Africa. This misconception has resulted in a lack of interest in the study of the disease in this country and is reflected in the almost complete absence of any published work on rickets in the South African medical literature. Since my first introduction to pediatric practice among non-European children at the Coronation Hospital in 1946, I have seen many hundreds of cases of rickets among both out-patients and in-patients.

The possibility of adequate clinical research work has been decreased by the difficulties of examining, and obtaining adequate blood samples, from infants during a busy and overcrowded out-patient session. Follow-up work among the Bantu is notoriously difficult. Most of the patients are from poor homes in the locations that surround the hospital. The mothers cannot afford the time and expense involved in travelling the long distances and in waiting for the long periods which the examinations, both clinical and radiological, necessitate.

Many mothers are forced by their economic circumstances to undertake part- or full-time work away from home. Once they see that their child has improved on the therapy given, it is extremely difficult to get them to return for follow-up visits. I have, however, managed to investigate fully a sufficient number of cases to be able to state that mild rickets occurs frequently, and severe florid rickets not uncommonly, among non-European infants in Johannesburg.

There has been very little published on rickets in South Africa in either the local or international medical literature. The only reference to the disease among non-European children that I have been able to find was by Kark and le Riche.[1] They reported six cases of healed rickets with skeletal deformities in Zulu children between the ages of six and nine years, whom they had observed during a nutrition survey carried out in 1938-39. Four of these cases were X-rayed.

The incidence of rickets in South Africa has on occasions been mentioned as the opinions and impressions of observers who varied greatly in their ideas about the extent of the disease.

Hess [4] quotes Dick (an English authority on rickets) who states—in his book on the subject published in 1922—that from personal observation 'even in the mildest form rickets is exceedingly uncommon in the immense elevated plateau of which the Karoo forms so great a part. This applies to the Native children and to the offspring of the Dutch and English parentage alike'. Dick was informed that in the Cape Colony cases of rickets were few and far between. One physician who had been in practice in the Cape for many years, however, stated that rickets occurred fairly frequently in the poorer classes of the whites and occasionally among the well-to-do.

Hess [4] also makes reference to an article by Peiper [5] in 1912, who reported that no mention of rickets was found in the medical literature of German East Africa between 1903 and 1911.

In a paper on the anti-rachitic value of sunshine in Cape Town, Irving and Schwartz [6] mention a personal communication from the Medical Officer of Health in Cape Town to the effect that 'mild rickets is not uncommon in both European and non-European children attending the Cape Town municipal clinic'.

A leading pediatrician [2] who has practised for many years in Johannesburg, has stated that 'in South Africa rickets is rare'.

A similar observation has been made by Gelfand [7] in his book *The Sick African*. He says: 'Rickets is probably not seen and must be very rare amongst the Natives of Africa. The reason would appear to be the important part played by sunlight in the prevention of the disease'. In discussing vitamin D deficiency among African children he reiterates his previous statement: 'In my experience, and probably that of others working among the Africans, rickets is not encountered. I have on many occasions looked for evidence of it in children whose diets were obviously deficient in vitamins, but

without success. The reason for the absence of rickets in the Native child is probably the abundant sunlight to which he is exposed'.

In a summary of the findings of the *Committee on Nutrition in the Colonial Empire* published in 1939 quoted by Kark and le Riche [1] the report states that there is no mention of the disease in Bechuanaland, Swaziland or Basutoland.

A similar lack of precise knowledge regarding the incidence of rickets has been a feature of the history of the disease in almost every country of the world.

Hess [4] frequently points out how contradictory reports have been made by different observers about the occurrence of the disease. In one statement he says: 'It is self-evident that an investigation of the incidence of a disease presupposes the correctness of the diagnosis and that a considerable number of cases are not being overlooked. Until very recently physicians have shown a lamentable ignorance of its primary clinical manifestations. This criticism applies to the children's specialists as well as to the general practitioner throughout Europe and the United States. It is not uncommon in relation to one and the same locality at practically the same period to meet with absolutely contradictory data furnished by clinicians of high standing'.

The main reason for the lack of study of rickets in South Africa is due, in my opinion, to the widely-held concept that rickets should not and therefore does not occur in a country renowned for its abundant sunshine. Although rickets occurs most commonly in countries in the temperate zone, it has also been frequently reported from localities lying nearer the equator and receiving abundant sunlight.

Its occurrence has been reported [4] in India, Australia and New Zealand, Egypt, and in Trinidad which lies 7° above the equator. Infantile rickets has been reported from South America.[15] Hess [4] quotes Jean Baptiste, who studied the disease in Algiers, as saying: 'In Algiers, land of sunshine, rickets exists; it is infrequent in the country but frequent in the cities'. Klasmer,[8] in discussing the divergent opinions regarding rickets in the Middle East, feels that the only point generally accepted is that severe rickets occurs rarely.

There is also evidence to suggest that the dark-skinned peoples are more susceptible to rickets than those with unpigmented skins. Hess [4] strongly supports this contention. He feels that the dark skin filters out the ultra-violet radiations. He has found that among a group of negro children studied in New York City all the bottle-fed and the majority of the breast-fed infants showed clinical signs of rickets. To prove his contention he carried out an experiment on two groups of rats, one composed of white and the other of black animals. Both groups were given a standard rickets-producing diet and exposed to a minimal protective dose of ultra-violet light. He found that while the black rats developed rickets, none of the white rats showed any evidence of the disease. Eliot and Park [9] while agreeing that there is an increased susceptibility to rickets among the dark-skinned races, feel that this only becomes manifest when they leave their ancestral homes. These workers also think that the inherent susceptibility is not related to skin pigmentation but may have resulted from their failure to develop resistance to the disease because they have always lived under conditions where the ultra-violet light has been excessive. Hess [4] is of the opinion, too, that the negro and certain Southern races show a racial susceptibility to rickets when they migrate to northern climates.

Since rickets has been reported from tropical and subtropical areas, and since there is evidence that racial susceptibility and skin colour are factors which affect the incidence and development of rickets, it is puzzling to find that rickets is reported to be practically non-existent in South African Natives, who suffer from both the racial and the pigmentary disabilities mentioned.

In assessing the antirachitic value of sunshine, many factors must be considered. Sunshine is composed of heat rays which have wave lengths longer than 760 mu, visible light whose wave lengths vary from 760-380 mu and invisible ultra-violet rays with a range from 380-290 mu. The latter constitute less than 1% of the total solar energy and only a small fraction of the ultra-violet rays have an antirachitic action.

According to Sonne and Rekling (quoted by Eliot and Park [9]) radiations at 313 mu exert a slight antirachitic effect, those between 302 and 253 mu a strong effect and the rays with a wave length below 248 mu a very feeble effect.

The quality of these ultra-violet radiations is further influenced by altitude, latitude and the presence of dust, smoke, fog and moisture in the atmosphere. The higher a locality above sea level, the less the enveloping atmosphere and the freer the penetration of the ultra-violet rays. The further away a locality is from the equator, the more oblique and indirect are the rays it receives and consequently the less effective. The radiations in the higher latitudes of the temperate zone reach their maximum at the summer solstice.

Tisdall [10] states: "A survey of the geographical distribution of rickets shows that the disease is unknown or exists only in a mild form in those places where the sun is always above 35° at noonday. From this information the period of the year during which rickets will probably develop can be calculated for any city in the world'.

In Glasgow, where rickets was very common, the altitude of the sun above the horizon is under 35° for six months of the year. In Cape Town at the winter solstice the altitude of the sun is 33°, while in summer it reaches a maximum of 79°. Irving and Schwartz [6] estimated from their animal experiments that the summer sunshine in Cape Town had sufficient antirachitic action to prevent rickets but that the winter sunshine had very little protective value.

In Johannesburg, latitude 26° 2′ South, altitude 5,735 feet, the altitude of the sun above the horizon varies between 40° in winter to 87° in summer. It is therefore in the non-rickets zone of Tisdall mentioned above.

Although no animal experiments have been carried out in Johannesburg to assess directly the antirachitic value of sunshine, it is possible to get some idea of this value from the data published by Osborn and Raftery.[11] These workers estimated the ultra-violet light content in South Africa by means of a modification of the Leonard Hill acetone-methylene-blue-method. During

five winter months Johannesburg received more than double the amount of ultra-violet radiation than Cape Town, as estimated by this method. This provides further support for the contention that in Johannesburg the annual average of 3,165 hours of sunshine provides sufficient ultra-violet light of enhanced quality due to its high altitude, to prevent rickets throughout the whole year.

Irving and Schwartz have estimated the antirachitic value of the summer sunshine in Cape Town to be equivalent to at least 2,500 international units daily. By comparing the values of ultra-violet activity estimated by Osborn and Raftery, it would appear that the daily value of the summer sunshine in Johannesburg is equivalent to an intake of at least 4,500 international units of vitamin D.

Notwithstanding the abundant sunshine with a high antirachitic value, rickets is of frequent occurrence among both breast- and bottle-fed non-European babies in Johannesburg.

If one accepts that rickets follows on inadequate exposure to sunshine, then it must be presumed that the non-European infants in Johannesburg are not receiving the benefits of the available ultra-violet radiations. There is evidence to suggest that in other parts of the world, where the sunshine is abundant, rickets occurs because the local manner of housing and dress, and the racial and religious customs prevent the utilization of the antirachitic effects of the sunshine.

Hess [4] attributes the occurrence of rickets, osteomalacia and tetany in parts of India to the purdah system, which deprives women of the available tropical sunlight. For the incidence of infantile rickets among American Indians in Mexico he blames the local custom of swaddling infants and strapping them to their mother's backs during the early months of life. Moore,[12] in a survey of 943 children in the five-year-old age group, in Portland and San Diego where the average annual sunshine is 2,194 and 3,024 hours respectively, found that 90% exhibited three or more signs of rickets. He suggests that the 'present custom of clothing, housing and diet tend to modify the antirachitic value of sunshine'. Eliot and Park [9] maintain that the reason for the special prevalence of rickets in cities is that in them the artificial conditions of living have reached their most extreme development and both sunshine and skyshine are greatly reduced by the walls of buildings and by dust and smoke.

Robert Hutchinson [13] attributed the increase of rickets in England at the beginning of the present century to three main causes, viz. the inability of mothers to nurse their own children; the increase in the number of female workers ('women go to work in the factories and their children are left at home badly looked after and improperly fed'); and the tendency for the population to be crowded together in large cities. Still [14] also blamed the factory system as a cause of rickets. He felt that the increase in the number of working mothers affected the infants adversely as a result of too early weaning and improper feeding. He also says, however, that 'rickets is by no means uncommon in the country' where causes like overcrowding and lack of sunlight were not operative. He maintained further that 'clinical evidence seems to show that there was no necessary connection (between rickets) and environment'. Hess [4] while stressing that 'the map of the incidence of rickets is the practical equivalent of a map of the deficiency of sunshine' emphasized certain qualifying factors, the most important of which was the congestion of population. He, too, blamed industrialism for bringing about the 'crowded cities with narrow sunless streets' and for 'forcing the mother into the factory or shop and thereby depriving the infant of maternal care and supervision'.

It must be remembered that there was little mention of rickets in Britain until the seventeenth century, when its widespread appearance gave rise to official concern culminating in Glisson's publication in 1650. This was the first adequate report on clinical rickets. The disease affected the great majority of the children of Britain and was thereafter known in Europe as the *Englische Krankheit* or English disease. Its appearance in Britain at a time when the Industrial Revolution had caused the drift away from the country to the towns of large sections of the population does suggest that industrialization and its accompanying unhygienic overcrowding played no small part in the genesis of the disease.

In Johannesburg in the past few decades a social and economic change in the lives of the Bantu peoples has occurred similar to that which took place in seventeenth century England. There has been a similar movement of large numbers of rural Bantu to the towns, where they are herded together in locations. These slums are grossly overcrowded, sanitation is poor and housing often consists of shacks and tin shanties which are poorly ventilated.

The absence of parks and open spaces and the polluted atmosphere due to the many wood and coal fires, which form the only means of cooking and warmth that they possess, detract greatly from the value of the available ultra-violet radiations. Poverty has driven many of the mothers to seek work in domestic service and in the factories. This has resulted in a decrease in the duration of breast feeding and the early introduction of artificial feeding which is unsuitable because of dietary ignorance and the high cost of milk foods. It has also resulted in the practice of leaving the children in the charge of aged grandparents and older siblings who find it safer and easier to let these infants remain indoors for the greater part of their infant life. Where necessity demands that the infant should accompany the mother, it is carried on her back covered by a shawl or blanket so that only the face and the head remain exposed. For protection from the wind and the sun even this small possible area of exposure to ultra-violet radiation is covered over with a woollen or cloth bonnet. The factors mentioned above, together with the black skin and reported racial susceptibility of the Bantu children, are probably the causative factors for the appearance of rickets in Johannesburg where both the quantity and quality of the sunshine is such as to make the occurrence of rickets very unlikely. What is true for Johannesburg probably applies to the other large towns and cities throughout the Union.

The position among the rural Bantu infants is at

the moment a matter for speculation, since no studies of rickets in these children have been carried out. A survey of rural Bantu children living under conditions where the overcrowding and infant neglect of the cities should not operate, would give a great deal of information regarding the natural history of rickets. Although mild and moderate rickets is so frequent among infants, it is rare to find active cases in children over the age of two years. The only reason I can advance for this phenomenon is that once the Bantu child is able to walk and take care of himself, he is allowed to roam the streets of the location throughout the daylight hours. Clothing, because of economic necessity, is usually minimal and allows exposure of the body surface adequate not only to heal any rickets that may be present but also to prevent any further episodes of the disease from developing. The gross inadequacy of schools also prevents his being confined indoors for any considerable portion of the daylight hours. The few cases of bowlegs, knock knees and other skeletal deformities which are occasionally encountered are probably a result of those cases of severe rickets that have occurred in infancy. These children, because of the muscular weakness which is a feature of the disease, walk at a late age and because of their illness are confined indoors for long periods. When they do eventually walk, the skeletal deformities are so advanced that when healing takes place these remain.

Since rickets does occur in South Africa, it is imperative that steps are taken to eliminate it by the provision of vitamin D to all infants, as has been so successfully done in Great Britain. In a recent survey [16] in that country, of 3,328 children aged 3-12 months, only 17 showed signs of active rickets and 56 signs of healed or healing rickets. We are fortunate in South Africa in having abundant supplies of natural fish liver oils which are rich in both vitamins A and D. It should not prove either difficult or costly, for those authorities concerned with infant welfare, to arrange for the free distribution of these fish liver oils, where they are required. This policy is necessary since rickets is indirectly a cause of a great deal of infantile morbidity and sometimes even mortality. Rickets, contrary to the generally accepted idea, is a disease of babies and not of bones.

In future publications I hope to show what its effect has been on the growth and development of those infants with the disease that I have investigated. No allowance was made by the National Nutritional Council in 1942 for vitamin D in their recommended allowances of specific nutrients. They felt that 'an adequate supply is assumed provided light clothing is worn and there is reasonable exposure to sunlight'. Conditions in the urban locations are such that we cannot rely on the natural sources of vitamin D provided by our sunshine and we must arrange to supplement them during the period of infancy by additions to the diet.

CONCLUSIONS

1. Rickets in mild and moderate degrees of severity is of frequent occurrence among non-European infants in Johannesburg.

2. Although the available sunlight contains adequate amounts of ultra-violet activity to prevent the occurrence of rickets in Johannesburg throughout the year, the environmental and economic conditions of the urban non-European prevents the proper utilization of this source of antirachitic vitamin.

3. It is necessary to make additions of vitamin D in the form of fish liver oils (of which adequate supplies are available in South Africa), to the diet of all urban non-European infants.

4. A survey of the incidence and distribution of rickets among both urban and rural non-European infants is very necessary since no information regarding this deficiency disease exists.

SUMMARY

1. The finding of many cases of rickets of all stages of severity is reported.

2. The history and reported incidence of the occurrence of rickets in South Africa is reviewed.

3. The climatic and geographical conditions in Johannesburg and the quality and quantity of its ultra-violet radiations have been analyzed and found to be sufficient to prevent the occurrence of rickets.

4. The incidence of rickets in other parts of the world receiving adequate sunshine is mentioned and the local conditions responsible for the occurrence of rickets in these localities are discussed.

5. The relationship that exists between urbanization and the rickets rate in a community is reviewed and the conditions and local customs responsible for rickets among non-European infants in Johannesburg is analyzed.

6. A plea is made for adequate study of the problem of rickets in South Africa.

7. Dietary additions of vitamin D is recommended for all urban non-European infants.

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EDITORIAL

The Editor, the Medical Secretary and the Staff of the Head Office extend to all members of the Association the compliments of the season and best wishes for the new year.

PREFRONTAL LEUCOTOMY*

It is only during the past 14 years that surgical treatment has been used for mental illness, since Moniz[1] in 1936 reported the effects of sectioning the frontal lobe fibres in man. The operation of prefrontal leucotomy has since become widely recommended in the treatment of selected cases of psychosis and chronic neurosis. It is not technically difficult, and most teams have a mortality rate of less than 3%. The operation has also been found to alleviate hypertension, and numerous reports[2, 3] have appeared of its use to relieve intractable pain in patients who are mentally normal.

The usual operative procedure adopted is the bilateral division of the frontothalamic fibres with a blunt leucotome inserted through burr holes. Following the operation the patient often experiences an incontinence of urine which may last for many weeks. A serious late complication is the development in about 10% of patients of epileptiform seizures.

If personal characters such as foresight, moral judgment, higher abstract thought and some aspects of creative thought can be localized in the brain, it appears likely that the frontal lobe is the part concerned. Moniz[4] suggested that if the connexions the frontal lobes had with other parts of the brain were interrupted, faulty synapses would be severed and the morbid constellations of ideas dispelled.

Hoch[5] admits the possibility of the highest functions,

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3. Scarff, J. E. (1949): Surg. Gynec. Obstet., **89**, 385.
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5. *Symposium on Leucotomy*, (1949): Brit. Med. J., **2**, 700.

* Since the preparation of this Editorial, a Judicial Committee of Inquiry has been appointed (Government Notice No. 2979 of 1 December 1950) to go into certain problems associated with the operations of leucotomy and the various coma and shock treatments.

VAN DIE REDAKSIE

Die Redakteur, die Mediese Sekretaris en die personeel van die Hoofkantoor wens al die lede van die Vereniging 'n gelukkige Kersfees toe en alles van die beste vir die Nuwe Jaar.

PREFRONTALE LEUKOTOMIE*

Dit is slegs gedurende die afgelope 14 jaar, sedert Moniz [1] in 1936 verslag gedoen het van die uitwerkinge van die afsnyding van die weefsels van die frontale lob van die mens, dat snykundige behandeling vir sielsiekte aangewend is. Die prefrontale leukotomie-operasie het sedertdien hoog aangeskryf geword by die behandeling van uitgesoekte gevalle van psigose en kroniese neurose. Tegnies is dit nie moeilik nie en die meeste spanne het 'n sterftesyfer van minder as 3%. Daar is ook gevind dat die operasie oorspanning verlig en talryke verslae [2, 3] het verskyn oor die gebruik daarvan om hardnekkige pyn te verlig by pasiënte wat verstandelik normaal is.

Die prosedure wat gewoonlik by die operasie gevolg word, is die bilaterale verdeling van die frontale weefsels van die *thalamus* met 'n stomp leukotoom wat deur boorgate ingesteek word. Na die operasie ondervind die pasiënt dikwels 'n onvermoë om sy urine op te hou wat baie weke mag duur. 'n Ernstige latere verwikkeling is die ontwikkeling van aanvalle soos dié van vallende siekte by ongeveer 10% van die pasiënte.

Indien persoonlike eienskappe soos vèrsiendheid, morele oordeel, hoër abstrakte dinkvermoë en sommige aspekte van skeppende dinkvermoë tot een plek in die brein beperk kan word, lyk dit waarskynlik dat die frontale lob die betrokke plek is. Moniz [4] het te kenne gegee dat indien die frontale lobbe se verbindings met ander dele van die brein onderbreek word, gebrekkige sinapse afgesny sou word en die morbiede idee-groepe verwyder sou word.

Hoch [5] erken die moontlikheid dat die hoogste

1. Moniz, E. (1936): *Tentatives operatoires dans le traitement de certaines psychoses*, Parys: Masson et Cie.
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4. Moniz, E. (1936): Amer. J. Psychiat., **93**, 1379.
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* Nadat hierdie inleidingsartikel geskrywe is, is 'n Geregtelike Komitee van Ondersoek benoem (Goewermentskennisgewing No. 2979, 1 Desember 1950) om ondersoek in te stel aangaande leukotomie operasies en die verskillende koma- en skok behandelings.

such as creativeness, planning and fusion of emotional and intellectual functions, being ascribed to the frontal lobes. However, the exact relationship of the frontal lobes and mental illness is an absorbing problem which has not yet been solved. Meyer and McLardy[6], who studied 95 brains of patients dying some time after operation, were not satisfied that mental faculties could be ascribed to separate portions of the frontal lobes. They found that a remarkably specific degeneration of the dorso-medial nucleus of the thalamus followed the operation.

That much investigation is being made of the changes in behaviour of leucotomized patients is reflected by the considerable medical literature on the subject. In addition, much unscientific speculation has occurred and many unwarrantable conclusions have been drawn. The operation has been spoken of as a mutilation. It has been described as a grave infringement of the rights of the individual, done in many cases merely for the convenience of the defenceless patient's relatives. A case has been reported in which the wife said that her husband's soul had been destroyed.[7]

It must be remembered that prefrontal leucotomy is in most cases adopted only when all other methods of treatment have failed. Further, as Partridge[8] has emphasized, the post-operative state should always be judged in the light of the psychiatric condition before operation, and the prognosis which it carried. Leucotomy does not, as some lay persons have feared, leave the patient in a vegetable state. Although a few cases of progressive mental deterioration have been reported, the operation may usually be expected to have some beneficial effect if the candidates for it have been properly selected.

The operation is not indicated until it is evident that the patient will not respond to the more reversible and conservative forms of treatment: psychotherapy, electro-convulsions and deep insulin therapy. The operation does not cure any specific illness, but is of value when particular constellations of symptoms are present, viz. worry, depression, fear, agitation and tortured self-concern. The most successful results are obtained in those patients who have a high degree of emotional tension, many being completely relieved of the torturing mental preoccupation which has deranged their lives.

Obsessive neuroses have responded well to operation. In cases of schizophrenia, where complete emotional blunting has not yet occurred, leucotomy holds hope of improvement when other methods of treatment have failed. Patients with manic-depressive psychosis, who have few intervals of normality, may benefit from the operation. The results in patients with paranoid

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funksies soos skeppingsvermoë, die vermoë om planne te maak en die vereniging van emosionele en intellektuele funksies aan die frontale lobbe toegeskryf kan word. Wat egter presies die verband tussen die frontale lobbe en sielsiekte is, is 'n boeiende probleem wat nog nie opgelos is nie. Meyer en McLardy [6] wat 95 breine van pasiënte ondersoek het wat 'n ruk na die operasie gesterf het, was nie oortuig dat verstandelike vermoëns aan afsonderlike dele van die frontale lobbe toegeskryf kan word nie. Hulle het gevind dat daar 'n opvallende spesifieke agteruitgang van die dorso-mediale kern van die *thalamus* op die operasie volg.

Die talrykheid van die ondersoeke wat gedoen word na die gedragsveranderinge van pasiënte wat die leukotomisering-operasie ondergaan het, word weerspieël in die aansienlike hoeveelheid mediese literatuur oor die onderwerp. Daarbenewens het baie onwetenskaplike bespiegeling voorgekom en is baie ongeoorloofde gevolgtrekkings gemaak. Daar is van die operasie gesê dat dit 'n verminking is. Dit is beskryf as 'n ernstige skending van die regte van die individu wat in baie gevalle plaasvind vir die gerief van die weerlose pasiënt se naasbestaandes. 'n Geval is aangemeld waar 'n vrou gesê het dat haar eggenoot se siel vernietig is.[7]

Daar moet onthou word dat in die meeste gevalle daar van prefrontale leukotomie gebruik gemaak word slegs wanneer alle ander behandelingsmetodes misluk het. Voorts moet die toestand na die operasie, soos Partridge [8] benadruk het, beoordeel word in die lig van die psigiatriese toestand voor die operasie en die prognose wat daarmee gepaard gegaan het. Leukotomie laat nie, soos sommige leke gevrees het, die pasiënt in 'n vegetatiewe toestand nie. Alhoewel 'n paar gevalle van toenemende verstandelike agteruitgang aangemeld is, kan daar normaalweg verwag word dat die operasie in 'n mate 'n heilsame uitwerking het indien die persone op wie dit gedoen word behoorlik uitgesoek word.

Die operasie is nie aangewese totdat dit duidelik is dat die pasiënt nie op die herroepliker en meer konserwatiewe vorms van behandeling reageer nie: psigoterapie, elektriese skokbehandeling en insulienbehandeling deur diep inspuiting. Die operasie genees nie enige besondere siekte nie maar dit het waarde wanneer daar besondere simptoompatrone soos bekommernis, bedruktheid, vrees, agitasie en pynigende selfbekommernis aanwesig is. Die mees geslaagde resultate word verkry met dié pasiënte wat 'n hoë mate van emosionele spanning het en vele kry volslae verligting van die pynigende verstandelike afgetrokkenheid wat hulle lewens in die war gestuur het.

Obsessie-neuroses het goed op die operasie gereageer. In gevalle van schisofrenie, waar daar nog nie volslae emosionele verstomping plaasgevind het nie, hou leukotomie hoop vir verbetering in wanneer ander behandelingsmetodes misluk het. Pasiënte met maniesbedrukte psigose wat min tussenposes van normaalheid het, kan uit die operasie voordeel trek. Die resultate

6. Meyer, A. en McLardy, T. (1949): J. Ment. Sci., **95**, 403.
7. Hutton, E. L. (1947): J. Ment. Sci., **93**, 31.
8. Partridge, M. (1950): *Prefrontal Leucotomy*, Oxford: *Blackwell Scientific Publications.*

psychosis, who have otherwise intact personalities, are conflicting; while results vary, it does appear that the harmful drive of the aggressive paranoid may be reduced, and the torture of the sensitive paranoid alleviated. In general, the relief the patient will experience is largely in proportion to his emotional loading. Most are freed of their tension and distress, and become easier to live with; some are able to return to their former level of social responsibility.

The intellectual deterioration that results from leucotomy is small, amounting to about 8% of the I.Q. The leucotomized patient tends to regard his faults as inevitable, not blaming himself for them; he sets more store by speed than by accuracy. He is far less likely to introspect, or to take any thought for the future. His self-awareness is reduced, and he is unlikely to be disturbed by criticism of his behaviour. He is less persistent in a situation requiring endurance.[9] It has been shown by objective testing that a person's creative ability is not impaired by prefrontal leucotomy[10].

The operation is not advised when the patient may have a basic psychopathic state; he should have sufficient personality assets to make operation worth while. The post-operative personality will be a more primitive modification of the previous one. Undesirable symptoms which are part of the patient's intrinsic personality, and not due to emotional loading, may actually be exaggerated by leucotomy, the operation banishing the neurotic anxiety by which they were previously kept in check. It would also be wise in all cases to advise operation only when the patient can be adequately cared for afterwards.

Surgical treatment of mental illness is still in an experimental stage, and further experience alone will establish its value. The criteria for operation will doubtless be modified as greater knowledge is accumulated.

There are ethical and legal aspects of psychosurgery which are of vast consequence and require careful consideration. Nevertheless, it does appear that additional legislation would be superfluous. If the medical profession permits external control of leucotomy, it admits the possibility of general abuse, for it must be emphasized that the same standards apply to leucotomy as to any other surgical procedure. There is no reason to suppose that the surgeons and psychiatrists who recommend leucotomy to patients do not share the high ethical purpose of the medical profession as a whole. If two psychiatrists, on the basis of their training and special experience, agree that a particular patient is a candidate for prefrontal leucotomy, a further uninformed censoring opinion not based on expert consideration can only cause confusion, create prejudice, and hamper scientific progress.

9. Petrie, A. (1949): J. Ment. Sci., **95**, 449.
10. Ashby, W. R. (1949): J. Ment. Sci., **95**, 418.

by pasiënte met paranoïede psigose wat andersins onbeskadigde persoonlikhede het, weerspreek mekaar; alhoewel die resultate wissel, lyk dit of die skadelike neiging van die agressiewe paranoïed verminder kan word en die pyniging van die sensitiewe paranoïed verlig kan word. In die algemeen gesproke is die verligting wat die pasiënt ondervind grootliks in verhouding tot sy emosionele las. Die meeste word bevry van hulle spanning en nood en word makliker om mee saam te leef; sommige is in staat om tot hulle vorige peil van maatskaplike verantwoordelikheid terug te keer.

Die agteruitgang van die intellek wat uit leukotomie voortvloei, is gering en bedra ongeveer 8% van die I.K. Die geleukotomiseerde pasiënt vertoon 'n neiging om sy foute as onvermydelik te beskou sonder om homself vir hulle te blameer; hy stel snelheid meer op prys as noukeurigheid. Hy is minder van homself bewus en dit is onwaarskynlik dat hy deur kritiek op sy gedrag gehinder sal word. Hy hou minder vol in 'n situasie wat volharding vereis.[9] Daar is deur objektiewe toetse bewys gelewer dat 'n persoon se skeppende vermoë nie deur prefrontale leukotomie benadeel word nie.[10]

Die operasie is nie raadsaam wanneer die pasiënt 'n basiese psigopatiese aard het nie; hy moet genoeg persoonlikheidsbates hê om die operasie die moeite werd te maak. Die persoonlikheid nà die operasie sal 'n primitiewer vorm van die vorige wees. Ongewenste simptome wat deel van die pasiënt se intrinsieke persoonlikheid is en nie aan 'n emosionele las te wyte is nie, kan in werklikheid deur leukotomie vererger word daar die operasie die neurotiese vrees deur middel waarvan dit voorheen in bedwang gehou is, uit die weg ruim. Dit sal ook verstandig wees om by alle gevalle die operasie aan te raai slegs wanneer die pasiënt daarna toereikende sorg kan ontvang.

Snykundige behandeling van sielsiekte is nog in 'n eksperimentele stadium en alleen verdere ondervinding sal die waarde daarvan bevestig. Die eienskappe waarvan die operasie afhang sal ongetwyfeld verander word soos meer kennis opgedoen word.

Daar is etiese en geregtelike aspekte van psigosjirurgie wat van ontsaglike betekenis is en versigtige oorweging vereis. Dit blyk nogtans dat addisionele wetgewing onnodig sou wees. Indien die mediese beroep toelaat dat leukotomie van buite beheer word, erken hy die moontlikheid van algemene misbruik want dit moet beklemtoon word dat dieselfde standaarde op leukotomie van toepassing is as op enige ander operasie. Daar bestaan geen rede om te veronderstel dat die snykundiges en psigiaters wat leukotomie by pasiënte aanbeveel, nie die hoë etiese doel van die mediese beroep as geheel het nie. Indien twee psigiaters op grond van hulle opleiding en spesiale ondervinding saamstem dat 'n besondere pasiënt die operasie van prefrontale leukotomie kan ondergaan, kan 'n verdere oningeligte, afkeurende mening wat nie op vakkundige oorweging berus nie, slegs misverstand veroorsaak, vooroordeel skep en wetenskaplike vooruitgang hinder.

9. Petrie, A. (1949): J. Ment. Sci., **95**, 449.
10. Ashby, W. R. (1949): J. Ment. Sci., **95**, 418.

A WASSERMANN SURVEY ON AN UNSELECTED GROUP OF BANTU HOSPITAL OUT-PATIENTS

WITH SOME REMARKS ON THE WASSERMANN TEST

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In a previous investigation, O'Malley and Wilson[1] reported that in 1,000 unselected Bantu males the Wassermann test was positive in 7.4%. The inquiry was carried out over 16 months and the cases were chosen in an entirely haphazard manner from each batch of fresh arrivals at the Langa Native Township in Cape Town. This comparatively low incidence-rate of syphilis in a large group of African males was at variance with the findings of previous investigations, though I was always of the opinion that those members of the Bantu tribes who come and go in Cape Town, mostly from the Transkei Native Reserve, were not so heavily infected with syphilis as is popularly supposed. Accordingly, I decided to carry out a Wassermann survey on a group of Africans deliberately chosen so as to reflect the most unfavourable rate of positive Wassermann incidence. The subjects selected for this study were those attending the out-patient department of the hospital in the Langa Native Township.

The present report is the result of an analysis of the figures kindly supplied by Dr. Wilson, the Medical Officer-in-Charge. who was good enough to instruct his staff to take samples of blood and keep records. My thanks are therefore due to him and to his Bantu staff who supplied the material for this inquiry.

The population of the Langa Native Township is not an entirely static one, as many individuals make use of the residential and other facilities for a short period only, before moving on to other localities or returning to the Native Territories.

The Township is pleasantly situated in an agreeable, wooded area outside the City. It is clean and wholesome looking, far removed from those slums which infest portions of the City, and which are inhabited principally by members of the Coloured (non-Native) community.

The Langa Township authorities kindly supplied the following figures about the population as it was in May 1950. The total number resident at Langa at this time was 11,052 (about one-sixth of the Bantu population of the Cape Peninsula). Of this number 7,998 were adults and 3,059 children. Living in the married quarters were 6,000, which figure represents, more or less, the static portion of the Township's inhabitants. The remainder of the 11,052 was made up of single men living in the bachelor's quarters for varying periods of time plus a purely transitory or migratory portion, whose stay is of very short duration.

Table 1 shows that males predominate and of these the major portion represents unmarried individuals.

The survey began in August 1949, and from that time onwards blood specimens were taken from persons attending the out-patient department of the Langa Hospital with general medical and surgical complaints. In order to avoid overloading the laboratory, only a few specimens were taken each day, and these were chosen in a wholly haphazard manner by the Bantu nursing staff, so that the whole group on which the Wassermann test was done consists of unselected individuals, with varying complaints, attending the hospital from August 1948 to the beginning of May 1950.

TABLE 1: POPULATION OF LANGA NATIVE TOWNSHIP, CAPE TOWN, IN MAY 1950

Adults		*Children*		
Males	*Females*	*Males*	*Females*	*Total*
6,560	1,438	1,421	1,633	11,052

The tests were carried out in the Government Laboratory in Cape Town (the Director kindly agreed to undertake this additional work) and the method used was the Kolmer modification of the Wassermann test.

In all, the Wassermann test was performed on 822 out-patients, men, women and children, and of these 140 were found to give a positive reaction. Each individual was classified into various groups according to sex, marital status, age group and tribe and in the following tables the influence of these categories in making up the 'Positive' group is illustrated.

Table 2, e.g. shows how the results were affected by considering the sex of the patient.

TABLE 2: SHOWING THE NUMBER OF THOSE FOUND TO GIVE POSITIVE WASSERMANN REACTION, ACCORDING TO SEX.

	Total No. Tested	*No. Found Positive*	*% Found Positive*
Males	524	91	17·4
Females	298	49	16·4
Totals	822	140	17·0

It is clear that this figure of 140 cases of positive Wassermann reactions out of 822 tested is not alarmingly high, when it is remembered that this is not a normal group of people, but persons who are ill, and who have come to an out-patient department of a hospital for advice and treatment. In such a section of any community one would expect to find the highest incidence of positive Wassermann reactions (unless, of course, one went to a Venereal Diseases Clinic to gather material there!). It accords very well with the figure found in a previous survey—7% in 1,000 unselected

male cases, chosen at random on arrival at the Township and not from the hospital out-patient department.

In Table 3 the number of children in the group of 822 cases is shown. The sex of the children was not considered of any special importance from the statistical point of view and is omitted.

TABLE 3: SHOWING THE NUMBER OF POSITIVE WASSERMANN RESULTS OBTAINED IN CHILDREN AS COMPARED WITH ADULTS IN A GROUP OF 822 INDIVIDUALS

	Total No. Tested	*No. Found Positive*	*% Found Positive*
Adults	693	131	18·9
Children	129	9	7·0
Totals	822	140	17·0

Next, the marital status was considered. Table 4 shows that there was a significant statistical difference between results obtained in the married and single groups; the former gave a more unsatisfactory result than the latter.

TABLE 4: SHOWING THE NUMBER OF POSITIVE WASSERMANN RESULTS OBTAINED IN MARRIED AS COMPARED WITH SINGLE PERSONS IN THIS SURVEY

	Total No. Examined	*No. Found Positive*	*% Found Positive*
Married	399	82	20·6
Single	423	58	13·7
Totals	822	140	17·0

A further detailed analysis of the incidence of positive Wassermann reactions in the married and the single groups is contained in Table 5 where these two categories are further divided according to sex.

positive Wassermann reactions was relatively high, but in the older patients, in the groups 41-50 years and 51-60 years, although the number concerned was small, the positive Wassermann incidence was also high. It should be pointed out here that the numerical relation between the number of patients in these advanced age groups and the total number of out-patients in any given period is not known. For instance, the age group 51-60 years contributed only 21 individuals of the total 822 whose bloods were subjected to the serological test and of these 21, six were found to be positive. At the other end of the scale, to be noted is the fact that out of 41 individuals in the age group up to 10 years, only one was found to have a positive Wassermann reaction.

TABLE 6: SHOWING THE INCIDENCE OF POSITIVE WASSERMANN RESULTS IN VARIOUS AGE GROUPS

Years	0-10	11-20	21-30	31-40	41-50	51-60
No. Positive	—	14	51	37	31	6
No. Negative	40	136	226	191	74	15
Totals ...	41	150	277	228	105	21

The great majority of the patients included in this survey were members of the Xosa tribe whose homeland is in the Cape Province. The minority consisted of small groups from the Zulu and Basuto tribes, with an addition of odd individuals from some of the many African races outside the Union. Of the original 822, 731 were Xosas, so that in large measure the test can be said to indicate the serological status of that tribe. The remaining 109 were composed of Zulus (22), Basutos (43) and mixed races (44). These non-Xosa quotas were too small to permit a satisfactory comparison on a race basis. Nor did it appear that any statistically important fact could be extracted from such figures.

TABLE 5: A MORE DETAILED ANALYSIS OF THE INCIDENCE OF POSITIVE WASSERMANN IN MARRIED AND SINGLE PERSONS

	Married					*Single*				
	No. Examined	*No. Found Positive*	*% Found Positive*	*No. Found Negative*	*% Found Negative*	*No. Examined*	*No. Found Positive*	*% Found Positive*	*No. Found Negative*	*% Found Negative*
Males	260	55	21·2	205	28·8	264	36	13·6	228	86·4
Females ...	139	27	19·4	112	80·6	159	22	13·8	137	86·2
Totals ...	399	82	20·6	317	109·4	423	58	13·7	365	86·3

It should be pointed out, however, that when an African or Coloured person is asked the question 'are you married?' an affirmative reply does not always mean that they have gone through an actual marriage ceremony. It may frequently mean that they are co-habiting with someone. The exact extent to which this laxity influences the figures in Table 5 is not known; neither was it revealed by the facts obtained in the survey how many married couples were included in the 'married' group.

The largest number of patients was in the age group 21-30 years (Table 6). Next in size was the age group 31-40. In each of these age groups the percentage of

The complaints which prompted these patients to seek relief at the Hospital Out-Patient Department (which is within easy reach of all residents in the Township) were varied and in many cases difficult to classify. Only nine of the whole positive group were suffering from a condition which was directly related to a venereal disease, e.g. urethral discharge, sores on the genitalia. A further group of nine complained of symptoms such as dysuria, lower abdominal pains, etc., which may have had their origin in a pathological condition of the pelvic organs. Under the heading 'various' appear patients complaining of conjunctivitis, headaches, vomiting, failing vision, faintness, etc.

TABLE 7: COMPLAINTS FROM WHICH PATIENTS SUFFERED, SUB-DIVIDED INTO GROUPS SUGGESTING THE LEADING SYMPTOM PRESENTING

Venereal Diseases	*Pelvic Organs*	*Skin*	*Cardio-Vascular Symptoms*	*General Pains*	*Bones and Joints*	*Abscess and Boils*	*Ulcers*	*Pulmonary*	*Various*
9	9	10	5	18	16	12	5	12	44

Table 7 is an attempt to divide the 140 Wassermann positive patients into groups characterized by the nature of the complaint for which they sought aid from their medical officer.

The patients found to have a positive blood Wassermann reaction were instructed to re-attend for a second confirmatory test. Not all of them did so. Indeed, very few complied with the advice of their medical officer, given by his Bantu staff, notwithstanding the fact that little inconvenience is caused by a visit to the hospital. Of the original 140, 78 failed to re-attend (56 adult males, 20 adult females and 2 children). Those who did come up for a second test numbered 62 and of these a second Wassermann test was positive in 59 (95%).

Now there is no reason to suppose that if the whole of the original 140 patients had reported for the second confirmatory Wassermann the result would have been any different. It is reasonable then to assume that, with the exception of a few cases, the second Wassermann test would have strengthened the presumption of syphilis created by result of the first. If we take into account those cases, which on repetition showed a negative Wassermann and apply this correction to the whole group, the real incidence of positive cases in the 822 persons tested would be 16.2%.

Naturally, those cases (59) whose infection was confirmed by a second Wassermann test were placed under treatment. Very few proved to be suffering from syphilis in an infectious or communicable form. The Union Health Department system of classification was used to assign these persons to their respective diagnostic categories and Table 8 reproduces the findings under these headings.

TABLE 8: THE TYPE OF SYPHILIS PRESENT IN 59 CASES WHOSE REPEATED WASSERMANN REACTION WAS POSITIVE

Seropositive Primary Syphilis	*Secondary Syphilis*	*Tertiary Syphilis*	*Latent Syphilis*	*Neuro-Syphilis*	*Congenital Syphilis over 1 yr.*	*Total*
3	1	15	38	1	1	59

Four of the cases are shown in Table 8 to be suffering from early infectious syphilis, i.e. 6.7%. The remainder were not suffering from symptoms which should have prompted them to attend the Venereal Disease Clinic in the first place. Two sessions for venereal disease patients are held each week in the out-patient department of the Township Hospital, one for males, one for females. The figures in Table 8 seem to indicate an awareness on the part of the population of the proper function of these special sessions, seeing that so few frankly venereal cases reported to the general medical out-patient department instead of to the V.D. clinic.

DISCUSSION

The value of the Wassermann test, as a diagnostic aid in uncovering syphilis, is open to criticism. The opportunity seems to be a good one for revising our knowledge of its shortcomings and for appraising the information conveyed by the test. The following remarks are not intended for the 'cognoscenti' but rather for the practitioner who is frequently confused and disappointed by the reports he receives on the serological status of his patients.

Nature of the Substance which Gives a Positive Wassermann Result in Syphilis. The exact nature of the substance contained in the serum of a syphilitic patient is not known. For convenience it is called *reagin*, or reacting substance. It is associated with the globulin fraction of the blood serum.

Normal blood serum contains 4.5 gm. of albumin and 2.7 gm. of globulin per 100 c.c. (Samson Wright's *Applied Physiology*.) The albumin molecules differ in size, diffusibility and electrical charges from those of the globulins. The addition of enough ammonium sulphate to produce half-saturation in the serum will precipitate the serum globulins, and if these globulins are removed from a syphilitic serum the supernatant fluid is Wassermann negative.

The globulin portion of the serum can be further dissociated into severel fractions, both by fractional precipitation and by electrical methods. Neurath and his associates [2] from the Duke University School of Medicine, U.S.A., have published several articles on the precipitation of the serum globulins by electrophoresis, a method which depends on the varying velocities of the protein components of the blood stream in a solution through which an electric current is passing. Under these conditions the various protein components move with the current at velocities depending on the nature and size of their molecules. Each component can be identified by its own characteristic velocity. A photographic record of this phenomenon can be made and its features reproduced diagramatically. By this method, and by fractional precipitation studies, the conclusion emerges that the substance which is responsible for the positive reaction in syphilitic serum is closely associated with gamma globulin.

Neurath and his colleagues studied the protein patterns of the sera from normal, syphilitic and suspected syphilis cases, i.e. from persons giving a false positive Wassermann reaction, and established that there may be an absolute, as well as a relative, increase in globulin content. The characteristic behaviour patterns, which they determined in the conditions mentioned, demand a technique which renders them

impracticable for everyday use, so that attempts to differentiate by electrophoresis between a particular gamma globulin that gives a true positive reaction and that which gives a false positive reaction have, so far, failed.

In syphilis, in other diseases and in some normal persons there is an increase of gamma globulin, a hyperglobulinemia in fact. But increase in gamma globulin in the serum will not, of itself, give a positive Wassermann reaction. Our conception of antibody formation in disease demands some purely specific factor in syphilis called forth by the presence of *Treponema pallidum*, and it may well be that this unidentified substance is closely linked with gamma globulin.

Though it has so far escaped identification by the biochemist, its presence has been revealed by Nelson,[3] who showed the existence in syphilitic serum of a factor capable of immobilizing active Treponemes in the presence of complement, under certain optimal conditions of temperature, dilution of complement, etc. This substance was present in the serum of syphilitic rabbits and in human syphilitic patients only. It is detected by examining a suspension of previously active spirochaetes, after it has been subjected to incubation with inactivated syphilitic serum and guinea-pig complement for several hours. The microscopic field is searched both for active and non-motile organisms. Nelson was able to prove that this immobilizing factor remains after the positively reacting factor has been removed by absorption. It is absolutely specific for syphilis, but the great technical difficulties involved in maintaining a live suspension of *T. pallidum* restricts its use only to highly equipped research laboratories.

On our present knowledge, then, we can say that the substance which reacts in a positive manner to the Wassermann test in syphilis is contained in the gamma globulin component of the serum. An identical or closely related substance is elaborated as the result of various pathological states. Some human beings possess this substance in their serum in varying quantities without being the subjects of syphilitic infection.

False Positive Reactions. Gamma globulin is a common enough substance and seeing that the antigen used in the Wassermann reaction is not a specific product of syphilis infection (the Wassermann antigen is obtained from ordinary beef heart muscle) it is not surprising that a positive reaction is frequently found in disease conditions other than syphilis. The list is a long one and is being added to yearly.

False positive Wassermann reactions are frequently found in the following conditions:—infectious mononucleosis, malaria, lympopathia venereum, granuloma inguinale, upper respiratory tract infections, spirochaetal diseases and many acute infectious diseases. It has been found in 0.4% of a group of 30,032 blood donors [4] and in some patients following vaccination. Particularly should it be noted that a false positive Wassermann reaction has been found in approximately 1:3,000 to 1:5,000 normal human beings. Although this is a low rate of incidence, it is high enough to constitute a problem for those who deal with large numbers of Wassermann tests, and for the individual concerned its presence is a real source of anxiety.

Fortunately, the amount of reagin present in non-syphilitic conditions is frequently very small and in many its presence is a transitory phenomenon. But in others small amounts of reagin appear in the blood from time to time apart from any syphilitic background, and all efforts to devise a laboratory procedure, as a verification test to distinguish between the true and the false, have met with but scanty success. The importance of Nelson's discovery of a specific body in the syphilitic serum which alone has the power of immobilizing and killing active *T. pallida* is thus realized. Its applicability to ordinary everyday universal use would end all our troubles in this field. Meanwhile, when we receive a report 'Wassermann positive' we should remember that this curt statement should really read as follows 'Under the conditions prevailing in my laboratory to-day the Wassermann test has reacted in manner that is usual with syphilis but which occurs with other diseases and conditions'. When clinical conditions or microscopic (dark ground) tests are available, the task of the clinician in interpreting a positive report is simple. But when no clinical evidence exists and there is no history of past events which suggest syphilis, a single unsupported Wassermann report should never be accepted as diagnostic. The correct procedure is to repeat the serological tests, both complement fixation and flocculation, at another laboratory if practicable, and to perform a lumbar puncture so that a complete examination of the spinal fluid may be done. In this manner the most important underlying cause of a persistent positive blood Wassermann reaction, i.e. asymptomatic neuro-syphilis, can either be discovered in time or eliminated. From the above it is obvious that the report that any given serum reacted positively to the Wassermann test does not at all mean that syphilis is present. In the series of 822 cases reviewed in this article there is, however, no evidence that any of the non-syphilitic causes of 'false positive' reactions was at work.

The behaviour of the Wassermann response in the blood of penicillin-treated cases of early syphilis corresponds fairly closely to the clinical progress of the patient. Only repeated quantitative tests can reveal the level of the reagin content of the blood and determine whether it is stationary, rising or falling. On the other hand, if there are two sera, one of which contains 50 times more reagin than the other, both may be reported simply as 'positive' by the ordinary, qualitative test; and a particular serum, which was once positive in 1:200 and is now positive only in 1:10 is likewise reported merely as positive, no account being taken in either case of the great disparity in reagin content between the specimens.

The relationship of clinical progress to the pattern of serological response to treatment has been studied by Hoekenga [5] and others in cases of early syphilis. They show that this response belongs to one of several patterns and that that one, which shows a continued high titre of positivity or a sharp sustained rise, warns of probable failure and impending relapse. The re-treatment of such cases is considered advisable.

In view of the fact that so many cases are being treated to-day with penicillin alone, which implies a

short treatment period, too much stress cannot be laid on the importance of a long post-treatment observation period in every case, and the advisability of repeated quantitative as opposed to qualitative, serological examinations. Failure to detect unfavourable responses to-day may well mean allowing our patients to develop unchecked, grave cardio-vascular or neurological complications later on. Moore, in his excellent monograph *Penicillin in Syphilis* stated that qualitative serological tests should be performed monthly; he advises that a reported rise in titre should be confirmed by one or two additional tests and considers a titre of more than 4 units, that is a serum positive when diluted 4 times (i.e. 16 Kahn 'units') as the signal for re-treatment.

True, the majority, after successful treatment, became negative in the first nine months, but the fact that many will fail to do so despite adequate, and eventually successful treatment, may not be realized universally. In other words, the syphilitic infection may be suppressed long before the blood becomes negative. Indeed, Thomas[4] draws attention to the possibility that a patient may be cured of one attack of syphilis and become infected a second time before the positive Wassermann reaction, due to the first attack, has become negative. In *late* syphilis, i.e. syphilis of over two years' duration and more, the Wassermann test will take a correspondingly long time to become negative. It may take many years for this to happen and in some cases it may never happen at all, although the syphilitic infection may have been eliminated by treatment. Obviously, then, there is not the slightest cause for surprise or alarm if some of our patients persist in being 'positive' even after generous treatment. The practitioner who keeps pumping in millions of units of penicillin in desperate anxiety fails to realize that, in some cases, he may be flogging a dead horse, that his patient is cured but that the curve of decline of reagin has not reached the 'negative' base line. He will not accelerate this fall by injudicious and superfluous treatment.

What then must the practitioner do? What course must he follow in view of all these seeming contradictions? The following rules may assist in providing a sound foundation on which to base his course of action.

No person should be deemed syphilitic until the diagnosis is established beyond all reasonable doubt. This is easy in early cases, if only recourse is made more frequently to one of the most positive diagnostic aids in the whole field of medicine—the finding of *T. pallidum* by microscopic examination.

A single Wassermann test should never be accepted as excluding or proving the existence of syphilis. The clinical lesion may be a primary chancre in the sero-negative phase. A positive Wassermann reaction in the absence of history or clinical signs may be due to causes other than syphilis, and these must be eliminated.

A persistently positive Wassermann reaction can be taken as evidence of syphilis if no other cause is apparent and if no treatment has been given. Naturally, the amount and nature of any treatment given will have to be taken into account in judging other cases.

An examination of the spinal fluid is imperative in presumed cases of untreated syphilis, particularly old-standing infections, so as to detect any underlying neurosyphilis.

After well-planned, intelligent treatment the syphilitic case must be followed up for at least two years and repeated Wassermann tests, preferably quantitative in nature, should be asked for. Slow decline must be expected in many cases but a sudden rise in titre demands the most thorough investigation. An examination of the spinal fluid must always be made.

No scheme of treatment, and no assurances of cure are beyond the human possibility of error or exception. Thus, the treatment and management of syphilis should not be undertaken lightly or its responsibilities overlooked.

SUMMARY

1. The results of a Wassermann survey of 822 Bantu, hospital out-patients are presented.

2. One hundred and forty (17%) gave a positive reaction.

3. Of the 62 patients who came for a second confirmatory test the result was again positive in 59. The remaining 78 escaped observation.

4. Only a small number (four) proved to be suffering from syphilis in an early infectious stage. There was one case of congenital syphilis, and one case of neuro-syphilis; the remainder were suffering from late and 'latent' syphilis.

5. The number of positive reactions in the 'married' group far exceeded those found in the 'single' group. This excess was not due to the fact that the former category contained a significant number of husbands and wives.

6. Some observations on the Wassermann test are appended.

My thanks are due to Dr. A. J. Wilson, the Medical Officer of the Langa Native Township, who kindly co-operated by instructing his staff to take samples of blood and keep the records; to Miss C. E. Prinsloo of the Nursing Staff of the Venereal Diseases Branch, City Health Department, Cape Town, who gave valuable assistance in analyzing the figures of the whole survey; and to Mrs. L. M. Waters of the clerical staff, who was responsible for the information about those patients who were eventually referred to the V.D. Clinic.

Finally, I have to acknowledge the consent of the Medical Officer of Health, Cape Town, Dr. F. O. Fehrsen, to publish these figures.

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PULMONARY TUBERCULOSIS

THE RESULTS OF TREATMENT AT BARAGWANATH NON-EUROPEAN HOSPITAL

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This paper reports a consecutive series of 42 cases of non-European patients suffering from pulmonary tuberculosis treated at Baragwanath Hospital.

During the last two years 35 beds have been reserved to study the possibilities of treating pulmonary tuberculosis in the South African Native and Asiatic peoples. The patients have been under regular supervision by the Baragwanath Thoracic Surgical Unit. Surgeon and physician have met weekly to consider the progress of the cases. Cases of unusual difficulty and interest have been presented to the Proceedings of the Baragwanath Medical Society for further discussion and consideration.

Initially the members of the Unit, none of whom had any experience of pulmonary tuberculosis in the South African Native approached the subject with an open mind owing to unfavourable opinions received from various sources. It was understood that fibro-caseous pulmonary tuberculosis was so fulminant amongst these people that treatment would be to little purpose. Notwithstanding this opinion the problem was approached as in the European.

The purpose of treatment has been to achieve complete control of the disease by the accepted means of rest, relaxation and resection of diseased lung. However well patients with pulmonary tuberculosis may appear with a sputum persistently positive for tubercle bacilli, the disease will be fatal in 94.5% of cases within 10 years.[1] We consider that if active treatment does not effect complete control after a period of trial it should be abandoned for more radical methods if they are likely to achieve the single object in view. The indication and purpose of treatment are clear and should be pursued uncompromisingly. Half measures are disappointing and more expensive than the employment of every method at the disposal of the experienced thoracic surgical unit.

CHOICE OF MATERIAL

Cases have been obtained mainly from patients admitted to Baragwanath Hospital. Some have also been received from Coronation, Rietfontein and Waterval Hospitals to which visits have been made by the Thoracic Surgical Unit. The patients have been preponderantly Bantu drawn from the urbanized Native areas in and around Johannesburg.

Before acceptance for treatment, the first essential required from the patient was an intelligent and full understanding of the danger of the disease, the need for 12 months in hospital and the probable need for surgical intervention at some time during the illness. This avoids disappointment and months of wasted bed space. It must always be remembered that the patient contributes a great deal, both mentally and physically, to any success which the surgeon and physician may achieve in treating pulmonary tuberculosis. The policy has been fully justified in the South African Native. In consequence only one patient has failed to pursue the treatment advised to its logical conclusion, viz. either complete control of the disease or the acceptance of failure when no further active or passive treatment is likely to be of avail. The one patient concerned refused the third stage of thoracoplasty after nine months in hospital.

The extent of disease has varied from minimal to moderately extensive, from exudative to fibrous and from slight to gross cavitation. Although 75% of the patients have had unilateral disease as judged by radiology, bilateral cases have been accepted if not too extensive. In short, they compare with the usual cross-section of European patients admitted as suitable for sanatorium treatment. In Figs. 1-5 a series of our successfully treated patients is presented with case histories and photographs of chest X-rays to illustrate the cases accepted for treatment by various methods.

The majority of patients have been able to speak either English or Afrikaans. Ignorance of these languages, however, has not denied admission provided good interpretation of Native languages has been possible. Sixty-eight per cent of the patients have been drawn from the labouring and domestic classes, the remainder from clerical and scholastic.

PRESENTING SYMPTOMS

Seventy-five per cent of these patients have been admitted with symptoms suggesting early pulmonary disease, viz. cough, pain in the chest and fatigue. Four patients were admitted with disease which was not directly related to the lungs, one with caseous epididymitis, two with tuberculous arthritis and one with a broken finger. It is noteworthy that the one with the broken finger subsequently agreed to lobectomy. Two patients were found to have pulmonary tuberculosis with cavitation on routine hospital staff chest X-ray.

CHOICE OF TREATMENT

A period of bed rest has always been allowed for the benefit of spontaneous healing. By appreciating the amount of healing that can be achieved spontaneously, the choice of future active treatment, if required, is likely to be better and the prospects of success better assessed. Three patients have spontaneously healed exudative disease with cavitation.

We consider that treatment by collapse, in whatever form, is most likely to succeed with the single cavity of moderate size surrounded by little or no disease.

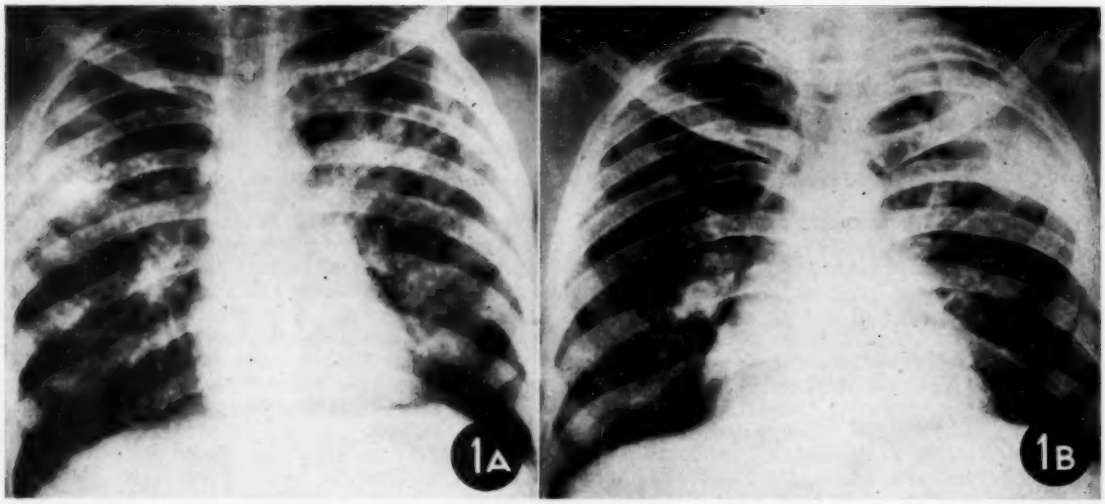

Fig. 1A (August 1948). Widespread tuberculosis of both lungs with cavitation.

Fig. 1B (September 1949). Left extrapleural oleothorax. Encysted mediastinal effusion right lower zone following abandoned pneumothorax. Disease controlled.

W.N. Bantu male. Plumber's hand. 25 years. Height: 5 feet 4 inches. *Admitted* to hospital August 1948 for 3 months' cough and pain in the chest. Weight 104 lb. *Treatment.* Failed left and right therapeutic pneumothoraces. Extrapleural apicolysis February 1949. Oleothorax June 1949. *Course.* Last sputum positive for tubercle bacilli in April 1949. *Discharged* from hospital in October 1949. Disease controlled. Weight 120 lb. *Out-patient Observation* (April 1950). Disease controlled. Returned to clerical work.

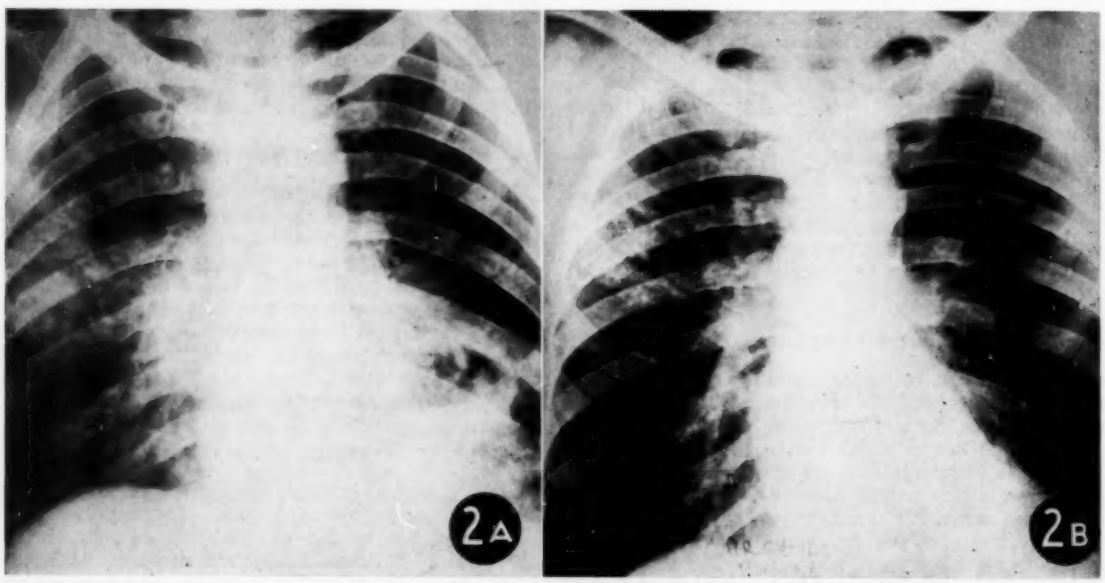

Fig. 2A (December 1948). Active bilateral tuberculosis with a large cavity in the left lower lobe.

Fig. 2B (May 1950). Shallow left therapeutic pneumothorax. Disease controlled.

A.M. Coloured male. Lorry driver. 37 years. Height 5 feet 11 inches. *Admitted* to hospital in December 1948 with haemoptysis and cough for one week. Weight 142 lb. *Treatment.* Left therapeutic pneumothorax induced February 1949. *Course.* Last sputum positive for tubercle bacilli in April 1949. *Discharged* on account of bad behaviour in July 1949. Disease controlled. Weight 150 lb. *Out-patient Treatment.* Maintenance of pneumothorax; 500 c.c. fortnightly. February and May 1950; disease controlled.

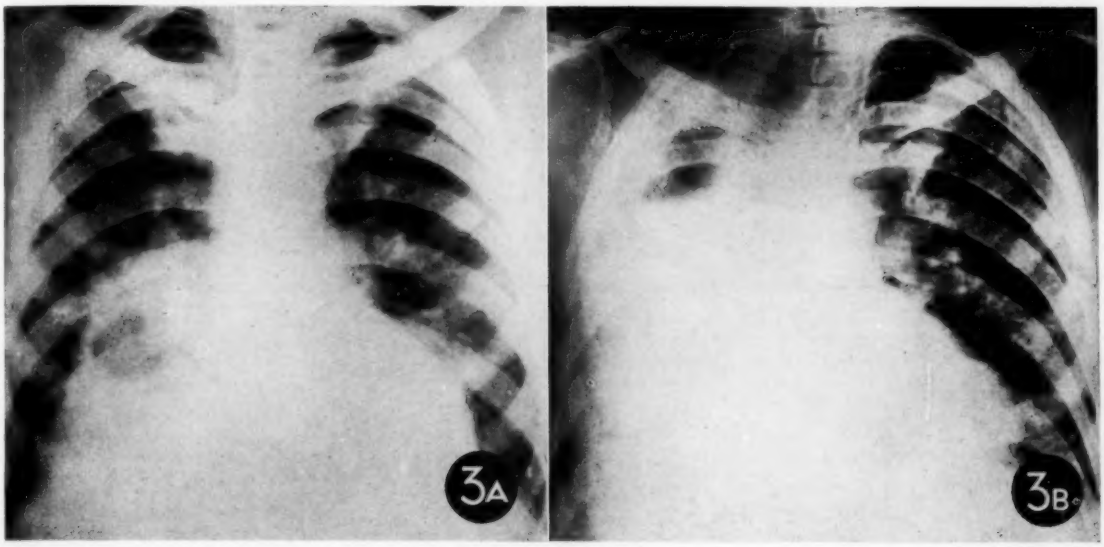

Fig. 3A (December 1948). Absorption collapse of right lower lobe with cavitation. Minimal disease of left lower zone.

Fig. 3B (June 1950). Pneumonectomy July 1949. Disease controlled.

D.M. Coloured male. Painter's hand. 47 years. Height 5 feet 4 inches. *Admitted* to hospital in October 1948 with haemoptysis and cough for 3 weeks. Weight 121 lb. *Treatment*. Streptomycin for 3 months before and 3 months after pneumonectomy in July 1949. *Bronchoscopy* demonstrated tubercles of the bronchial mucosa without ulceration. *Course*. Post-operatively uneventful until November 1949 when disease of the left lower lobe became reactivated with production of sputum positive on direct examination for tubercle bacilli. Subsequently this disease became quiescent. *Discharged* from hospital in July 1950. Convalescent. Disease controlled. Weight 122 lb.

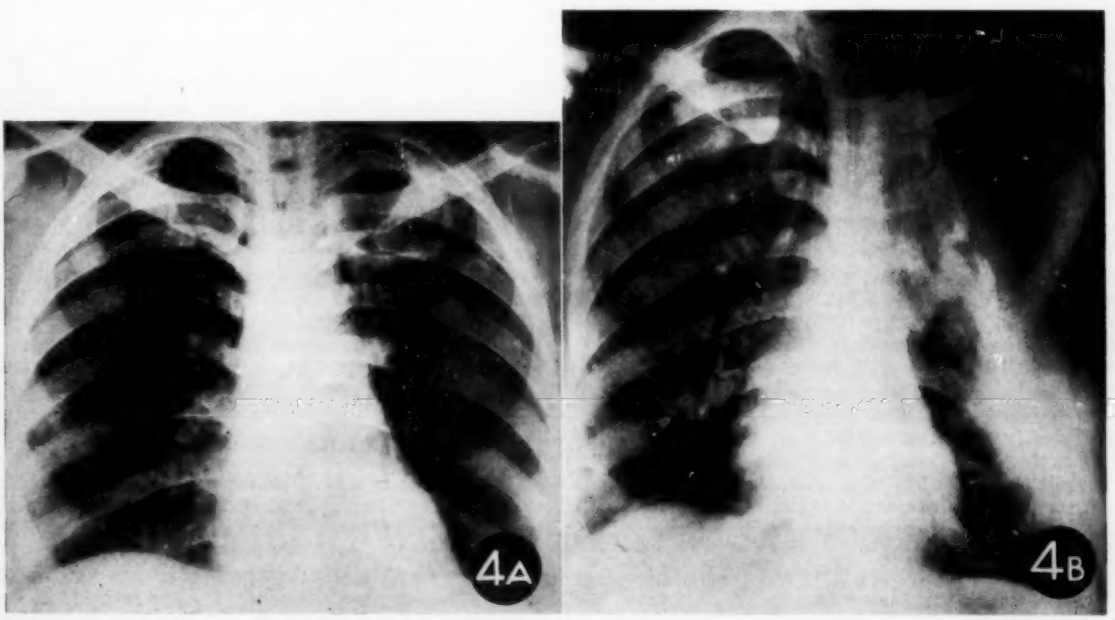

Fig. 4A (April 1949). Cavity of moderate size in the left upper lobe.

Fig. 4B (December 1949). Following 8-rib thoracoplasty. Disease controlled.

M.M. Bantu female. Housewife. 39 years. Height 5 feet 4 inches. Weight 152 lb. Transferred from the Bridgeman Maternity Hospital in November 1948 following normal delivery on 5 November 1948. *Treatment*. Eight-rib thoracoplasty in 3 stages (11 May 1949; 1 June 1949; 3 August 1949). *Course*. Uneventful progress. Last sputum positive for tubercle bacilli in July 1949. *Discharged* from hospital in September 1949. Disease controlled. Weight 160 lb. *Out-patient Observation* (February 1950). Convalescent. Disease controlled.

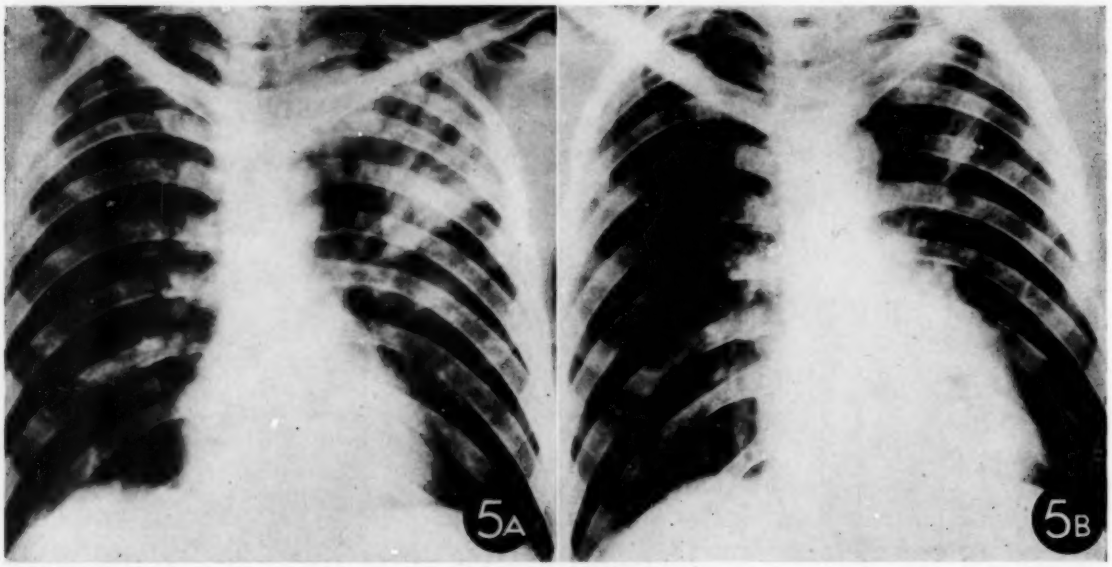

Fig. 5A (August 1949). Widespread exudative tuberculosis of left upper lobe with cavitation.

Fig. 5B (March 1950). Fibrosis of the left upper lobe. Disease controlled.

J.R. Bantu male. Chauffeur. 32 years. Height 5 feet 5 inches. *Admitted* to hospital in August 1949 for 3 weeks' cough and pain in the chest. Weight 106 lb. *Treatment.* Streptomycin for 3 months. *Course.* Last sputum positive for tubercle bacilli in December 1949. *Discharged* from hospital in April 1950. Disease controlled. Weight 113 lb. *Out-patient Observation* (July 1950). Convalescent. Disease controlled.

Multiple cavitation, large cavities, widespread bronchopneumonia and atelectasis are considered more suitable for resection provided the other lung permits radical surgery.

Intrapleural pneumothorax has been, until recently, very difficult to maintain after the patient's discharge from hospital and in consequence permanent forms of collapse have been preferred. However, some cases of intrapleural pneumothorax have been conducted successfully; in one patient for two years as an out-patient. A good intrapleural pneumothorax with its cushion of air offers an elastic medium, which is conducive to healing of the recent single cavity and it is unfortunate that this form of treatment is so seldom practicable.

Paraffin oil has been introduced successfully into the extrapleural and intrapleural space to effect permanent collapse. This has been performed only when the underlying lung disease has been controlled for at least two months.

Phrenic interruption with pneumo-peritoneum has been used mainly to supplement other forms of treatment. In one case, however, this treatment has succeeded alone.

Bronchoscopy has invariably been performed before resection and for diagnosis when bronchial disease has been suspected.

We believe that every patient with pulmonary tuberculosis should be considered potentially a surgical problem. In consequence, streptomycin has been reserved when major surgery has been contemplated and could then be used to cover the operation and the post-operative period. It is wiser to assume that after four months' treatment with streptomycin the sensitive strains of tubercle bacilli will have been replaced by the resistant, so that the drug will be of no further value to the patient. Further, we consider that streptomycin is seldom primarily responsible for healing in pulmonary tuberculosis.

Besides intelligence, friendly co-operation from the patient is essential for successful treatment during the long illness. Liking between the doctor and patient must be mutual and carefully preserved. Every little complaint of food and comfort must be considered impartially. Occupational therapy is most helpful in maintaining a cheerful atmosphere. Knitting has been most popular with 90% of the patients, both male and female.

CRITERIA OF SUCCESS

In Table I the results of treatment have been tabulated to show percentage success and failure. A patient has only been considered a success if the sputum and fasting gastric juice have been negative for tubercle bacilli on direct and cultural examination, the Westergren sedimentation normal, the patient well and asymptomatic and the X-ray of the lung fields satisfactory for at least six months. In order to ensure these criteria 90% of the patients have been retained in hospital for this period after the initial control of the disease. In the remainder the necessary observa-

TABLE I: ANALYSIS OF THE TREATMENT OF PULMONARY TUBERCULOSIS AT BARAGWANATH NON-EUROPEAN HOSPITAL FROM MARCH 1948 TO SEPTEMBER 1950

Type of Treatment	*Details of the Treatment*	*Results of the Treatment*		*Total*	*Died during Treatment*	*Racial Analysis*		
		Success	*Failure*			*Bantu*	*Coloured*	*Indian*
Collapse	Thoracoplasty	8	6	14	4	14	—	—
	Extrapleural apicolysis. Oleothorax	1	—	1	—	1	—	—
	Intrapleural pneumothorax ..	5	1	6	1	2	4	—
	Intrapleural pneumothorax. Oleothorax	1	—	1	—	1	—	—
	Intrapleural pneumothorax. Phrenic crush. Pneumoperitoneum ..	—	1	1	—	1	—	—
	Phrenic crush. Pneumoperitoneum	1	1*	2	—	1	1	—
	Extrapleural apicolysis. Oleothorax. Phrenic crush. Pneumoperitoneum	1	—	1	—	1	—	—
Resection	Lobectomy	3	—	3	—	2	—	1
	Pneumonectomy	5	1	6	1	4	2	—
Passive Treatment	Spontaneous healing	3	—	3	—	2	1	—
	With streptomycin	3	1†	4	1†	3	1	—
Total	.. ..	31 (73·9%)	11 (26·1%)	42	7	32	9	1

* Severe case of diabetes mellitus. † Tubercle bacilli found resistant to streptomycin throughout treatment.

tions have been made during out-patient follow-up. Control of pulmonary tuberculosis is not synonymous with cure. The disease cannot be considered cured until a unilateral lesion has been controlled for five years and a bilateral lesion for 10 years.[2] Livingstone [1] found that of 395 patients, in whom collapse treatment had achieved sputum conversion, 67.2% were alive at the end of 10 years. This suggests, therefore, that, allowing for an equivalent relapse rate, 49% of our 42 patients will be alive at the end of 10 years.

ANALYSIS OF THE RESULTS

The results of treatment are encouraging and compare favourably with results in other parts of the world where the thoracic surgical team operates. Such results can only be achieved by an experienced thoracic team, viz. surgeon, anaesthetist and physician. In only seven cases (16.7%) of the 42 has the thoracic surgeon not been required.

The series includes four patients with serious and extensive disease. These were initially considered to offer poor prospects for success and might justifiably have been excluded from the series. One of the failures had severe diabetes mellitus. One thoracoplasty failure was well in all respects except for a gastric juice examination positive for tubercle bacilli on culture five months after the apparent control. Two thoracoplasty failures were deaths under anaesthesia. On these occasions the anaesthetist to the Thoracic Surgical Unit had to entrust the anaesthetic to a junior colleague. It has been agreed by the team that each of these deaths was due to avoidable technical errors.

CONCLUSIONS

This preliminary experience of the treatment of pulmonary tuberculosis in South African Native and Asiatic people has been encouraging. The results have fully justified the hard work and expense entailed and are better than those in many forms of medical endeavour. The results agree with those in other parts of the world where pulmonary tuberculosis can be treated by up-to-date and well-tried methods. Understanding of pulmonary tuberculosis requires several years of specialized study by surgeon, anaesthetist and physician before a satisfactory percentage success can be achieved.

We wish to thank Dr. Loots of Rietfontein, Dr. Grek of the Coronation Hospital and Dr. Gaylis of Waterval Hospital for their kindness in sending us suitable cases for treatment.

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THE PATHOLOGY OF INTESTINAL STRANGULATION

A REPORT OF NINETY-FOUR CASES

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1. *Strangulation in Terms of the Mortality of Intestinal Obstruction.* The mortality rate of intestinal occlusion had been reduced from 60% in 1900 to 26% in 1925 (Souttar). By 1940 the rate was down to about 20% (McKittrick and Sarris). In 1947 Eliason and Welty were able to indicate a death rate of only 1% for simple occlusion, while Moses (1949) reports a mortality of only 6.3% for 223 cases.

This improvement has been very largely due to the introduction of gastro-duodenal drainage, antibiotics, improved anaesthesia, and the greater use of blood transfusion; but despite some gratifying results as indicated above, the overall mortality remains in the region of 10% to 20% (Nemir *et al.*, 1949). This is not much of an improvement on the 26% mortality indicated by Vick's review in 1932. When malignant conditions are excluded, it is apparent that strangulation remains the stumbling block. Nemir *et al.* (1949) remark that recent reports still indicate a mortality of 20% to 40% for strangulation, the death rate being higher when resection has to be carried out.

While diagnostic errors (Hamman and Alldis, 1950) are in part responsible for the high mortality, it is apparent, too, that the lethal mechanism of strangulation has not been fully explained, and is all too often irreversible in the patient.

2. *The Incidence of Strangulation.* One would think that the incidence should be on the wane. External herniae and post-operative adhesive obstructions form the bulk of cases; the former are usually dealt with by elective surgery, and the latter by intestinal intubation (e.g. Lewis *et al.*, 1940). Mesenteric vascular accidents, internal herniations, and idiopathic volvuli, are not common. Nevertheless, Nemir *et al.* (1949) cite an incidence of 17% to 33% of intestinal occlusions, while Eliason and Welty (1947) noted a 25% strangulation rate for their series. Moses (1949) noted strangulation in 97 of 223 cases. In the Bantu, who form over 80% of the material used for this paper, the rate is on the whole higher. The reasons for this have been previously considered (Hamman and Alldis, 1950).

Out of 152 cases of acute intestinal occlusion, proved by surgery or necropsy at the Coronation Hospital during the period 1944-1950, no less than 107 were 'loop' occlusions, and of these 94 were essentially strangulating in nature. The incidence of proved occlusions is therefore 61.8%. Had cases diagnosed on clinical grounds only been included, the rate would still be in the region of 40%.

3. *The Etiology of Strangulation.* Aird (1949) has wondered whether the reduction in the mortality from distension by the use of intestinal intubation has brought about an increase in mortality due to strangulation, while Moses (1949) found that surgery was indicated in 51.4% of 103 cases of adhesive occlusion.

In this series of 94 strangulations, of which 35 were 'Internal', the etiology was as follows: 45 external herniae; 17 adhesive occlusions; 8 volvuli; 5 internal herniations; 14 intussusceptions; 5 vascular accidents.

4. *The Pathology of Strangulation.* (a) *The Role of Vascular Occlusion.* While vascular occlusion is the *sine qua non* of strangulation, not every occlusion will lead to necrosis. A number of other factors are involved in the production of gangrene and perforation.

i. *The Incidence and Degree of Occlusion.* In this series of 94 strangulations, vascular insufficiency (gangrene or severe congestion) was evident in 60 cases (63.8%). Gangrene was noted in 25 cases (26.6%). Thus in 152 cases of acute intestinal obstruction, vascular insufficiency was noted in 39.4% and gangrene in 16.4%.

ii. *The Potential of the Intestine for Revascularization, and the Causes for the Breakdown of Collateral Circulation.* The vasa recta of the small bowel, for example, are not functional end arteries. There is within the wall of the gut a free anastomosis between such vessels, and, as pointed out by Noer *et. al.* (1949), following failure of the arcuate system this intramural collateral circulation is of more importance than may have been supposed. The experimental ligation of a single terminal vessel may have little or no effect (Rives *et al.*, 1948; Klein, 1921 and Rothschild, 1929) while the occlusion of an intermediary vessel proximal to the arcuate system leaves an adequate collateral circulation. When, however, a main trunk such as the superior mesenteric is obstructed, its collaterals are too few and too widely separated to guarantee vascular sufficiency. In this respect the inferior mesenteric artery is better off, and its occlusion does not necessarily lead to necrosis (Russel, 1950). Partial occlusion of a large vessel may be well tolerated (Councilman, 1894).

The venous collaterals follow the arterial pattern and are more profuse (Cokkinis, 1926).

Boyd (1938) remarks that it might appear strange that a part so well endowed with vascular channels should in practice behave as a terminal system and be subject to infarction. There are, however, a number of factors which lead to a breakdown of collateral channels in the clinical subject. Dogs, as shown by Derr and Noer (1949) have a high potential for revascularization.

Causes for the breakdown of circulation in practice are:—

(a) The mechanism of the bulk of strangulations is

such, that a partial or complete closed loop is established on one hand, while on the other, a generous portion of mesentry is compressed. As a result, in the longer loops, a number of vessels (veins rather than arteries) proximal to the arcuate system are occluded and a segmental gangrene may follow. In the short loops mesenteric involvement is less, but early stasis and infection leads to a rapid rise in intraluminal tension which tends to render impotent the intramural collaterals, and necrosis may follow. (The tension gangrene of Morison and Saint, 1927.)

(b) Infection, even in the absence of a closed loop, is an important factor. Davis *et al.* (1948) have shown that in rabbits a 7.5 cm. strangulated segment can develop a collateral circulation when infection is controlled with streptomycin.

(c) In vascular accidents, multiple embolization may occlude more than one terminal vessel, while vasospasm (Dunphy and Whitfield, 1940) or extension of a thrombotic process (Rives *et al.*, 1948) may lead to vascular insufficiency.

(d) A general lowering of circulatory efficiency, e.g. due to shock or cardio-vascular disease, may effectively block local attempts to establish a collateral circulation.

(e) Infection of and trauma to compressed vessels may lead to post-operative thrombosis where mechanically strangulated but viable bowel has been released by surgery.

iii. *The Site and Mechanism of Vascular Occlusion.* (a) *Primary Vascular Occlusion.* 'Primary' occlusions are uncommon. The term is not an exact one. Strictly speaking, 'primary' occlusions should follow disease of the mesenteric vessels themselves, but occlusions associated with cardiac disorders and circulatory failure, etc., are usually included in this group. For the purpose of this paper, one regards as 'primary' those occlusions which have not been associated with, or followed intra-abdominal infection and mesenteric trauma, as occurs in intestinal obstruction and peritonitis.

Such conditions are rare. Rives *et al.* (1948) noted 19 cases out of 55,232 surgical admissions (0.038%). Wangensteen (1945) puts the incidence at 0.02%.

i. *Arterial.* While arterial thrombosis may follow venous occlusion, primary embolization or thrombosis is rare on the whole, the former being seen more often (Rives, 1948; Wangensteen, 1945). Embolization may follow cardiac mural thrombi, valvular vegetations or aortic atheromatous plaques. The superior mesenteric artery is more apt to be oclcuded than the inferior (Illingworth and Dick, 1947). Arterial thrombosis may result from disease of the vessel walls, alterations in the blood-clotting mechanism and other causes. Mesenteric thromboangiitis and atherosclerosis are reported as being an occasional cause. We had only one case of primary arterial occlusion, in which gangrene followed embolization associated with bacterial endocarditis.

ii. *Venous.* Venous thrombosis may follow circulatory failure in cardiac conditions, or local circulatory failure in portal hypertension. It may also result from alterations in the blood-clotting mechanism, or follow operations on the stomach, pancreas, and spleen. Diseases causing arterial occlusion may also cause venous thrombosis. Rives *et al.* report a case due to lupus erythematosus.

We had only three such cases. One case followed gastro-enteritis in an infant, one was associated with congestive cardiac failure, and the third occurred in a young female suffering from extensive pulmonary tuberculosis. Cases occurring in infants are not common, but do present from time to time (Frank, 1932).

iii. *Combined Arterial and Venous Occlusion.* Infrequently this may be found in primary vascular disease, but it is usually a secondary event when arterial thrombosis follows venous occlusion in mechanical intestinal obstruction, and as such is a common entity.

(b) *Secondary Vascular Occlusion.* This is the common pathological entity. In the bulk of cases it is due to mechanical intestinal occlusion, and in others to peritoneal infections as seen in acute appendicitis and pelvic infections. The veins are usually involved in the first instance and the arteries secondarily. In our cases, vascular occlusion was secondary in 56 of 60 cases showing vascular insufficiency (93.3 %). In only one case did the occlusion follow infection unassociated with intestinal obstruction.

(c) *The Vessels Involved.* The superior mesenteric vessels suffer in the majority of cases. The inferior mesenteric artery is infrequently occluded in primary accidents, and is less often subject to infarction when occluded (Russel, 1950), while the majority of torsions, inversions, and ensnarings of bowel tend to involve the small rather than the large gut. In our series, all but one of 25 cases of gangrene involved small and not large gut. Gangrene was noted in 19 of 30 (63.3%) internal strangulations, excluding colonic volvuli. In 15 of these cases of infarction, a definite volvulus, due in most cases to adhesions, was present. On the other hand Weeks (1931) reports gangrene of the involved loop in only eight (12.5%) of 64 cases of sigmoid volvulus. On account of the heavy infectivity of the colon and the rapid distension which follows occlusion, one might expect a higher incidence of gangrene in colonic torsions. It has to be remembered, however, as pointed out by Weible (1914) that the tightness rather than the degree of torsion is important, and sigmoid volvulus is more readily diagnosed.

iv. *The Nature of the Infarct.* Almost all (but not all, as is sometimes stated) intestinal infarcts are haemorrhagic. Anaemic infarcts are rarely reported (Russel, 1950).

5. *Lethal Factors in Strangulation.* i. *Long Loops.* Shock, as demonstrated by Aird (1941) and Holt (1934), is probably the most important lethal factor, claiming precedence over toxaemia and peritonitis. In massive loops whole blood loss, as in external bleeding, is most important.

In seven cases, the loops were really long. One case had a four foot loop following mesenteric thrombosis. A ten-foot loop was found in a case of thrombosis following acute appendicitis. A third resulted from a total torsion of the small bowel in an 18-foot gangrene. In three patients, all females, a long loop of four to seven feet resulted from torsion or ensnaring due to

adhesions. The seventh case followed a traumatic diaphragmatic herniation.

Gangrene was found in six (85.7%); all were internal loops, and shocck was severe in all (100%).

Six of these patients died (85.7%), and five of six patients with massive gangrene (83.3%) died.

In three cases death resulted from severe irreversible shock associated with loss of whole blood (50%). Another patient survived resection but died of pulmonary tuberculosis while still in hospital.

ii. *Medium Loops.* A number of lethal factors are concerned. For the purpose of this paper, only those factors directly related to strangulation are considered, i.e. shock, toxaemia, and peritonitis.

The experimental work of Holt (1934), Aird (1938, 1934), Knight and Slome (1936), Maycock (1938), and Nemir *et al.* (1949) has done much to clarify the position.

Shock is a definite lethal factor, particularly in loops of two to three feet. Plasma loss (Aird) rather than loss of whole blood is involved, though obviously with venous occlusion of loops of two to three feet there will also be loss of whole blood. Moses (1949) contends that with adequate transfusion shock is hardly ever irreversible in strangulation, and this he asserts is incompatible with the 'toxic' theory. In those cases associated with mesenteric vascular occlusion Rives *et al.* (1948) remark that shock may be irreversible, though the longer loops are probably found in such cases.

Medium loops are the common clinical entity, and in our cases medium loops from one-half to three feet comprised 77 of 94 cases (81.9%).

Evans and Bigger (1947) found that shock, alone or associated with peritonitis, was the cause of eight out of 10 deaths in their series of 16 torsions.

In terms of the experimental work of Aird, however, it would appear that shock is not the only lethal factor in medium loop strangulation acting prior to rupture and bacterial peritonitis. In the shorter medium loops, following gangrene, death may take place after some days, without rupture, and where shock can have played only a small part.

Though the occurrence of 'toxaemia' has been disputed, there is much to support that it occurs. Following intestinal stasis there takes place a progressive increase in the bacterial content of the bowel lumen, but toxaemia would not appear to be a factor until devitalization of the gut wall has taken place (Crowley and Winfield, 1949). Thereafter, as Aird remarks, following invasion of the wall of the gut a wet gangrene ensues, and the peritoneal exudate which follows has been shown to contain measurable amounts of histamine (Aird and Henderson, 1937) and choline (Maycock, 1938). Nemir *et al.* (1949) produced in dogs strangulation of 30 cm. segments, and controlled distension and shock from the start of the experiment. Nevertheless, the presence in the peritoneal cavity of a red-black exudate was a sign of impending death before peritonitis and dissolution of continuity of the gut took place. This exudate when injected into other dogs in small amounts was lethal. On the other hand, the early exudate, a pink blood-stained fluid, was found at a time when the animals' condition was good, and the injection of this early exudate into other animals was not lethal. The earlier exudation is a filtrate of the blood and may remain sterile up to twenty hours (Murphy and Vincent, 1911; Blaine and Kennedy, 1946). With increased permeability of the gut, organisms from the lumen begin to appear in the pink exudate which are qualitatively the same as those found at a later stage in the lethal black exudate. It would appear then that while the early peritoneal bacteraemia, if one may so use the term, is not lethal, the late exudate is. Further, by spectrophometric analysis, Nemir and his co-workers were able to show in the lumen of strangulated gut the presence of haemin, or haemoglobin derivatives, which could later be found in the black exudate, and traced thence into the blood stream. This would tend to support the toxic theory, though it is not claimed that such pigments in themselves are the toxic agents. The author has found, as have most surgeons, that patients who have strangulating lesions with gut congestion and a blood-stained exudate, are in good condition, or will respond to adequate transfusion if shocked, unless there has been proximal distension of a severe degree. On the other hand, one has operated on patients with a medium bowel gangrene, who, while not having evidence of peritonitis, have a red-black exudate; these patients have failed and died despite adequate treatment for shock, skilled surgery, and modern antibiotic measures.

In our medium loop cases, it is difficult to assess the exact roles played by shock, probable toxicity, and peritonitis in fatal cases. Shock has been determined in the records on clinical grounds, while the term 'peritonitis' tends to be used rather loosely. Cases described as having died of peritonitis, when the peritoneal appearance is not stated, may well have died from toxaemia subsequent to infarction. In the author's opinion toxaemia does occur, and combined with shock, kills more patients than bacterial peritonitis. Toxaemia does not become a factor prior to infarction, and in the case of early deaths shock is probably the major factor.

We had 77 medium loop strangulations, of which 28 were internal, 13 were excluded (intussusceptions) and 36 external (external herniae). There were 19 deaths (24.67%), of which 12 were post-operative deaths, giving an operative mortality of 17.1%. Vascular insufficiency was noted in 50 (64.9%), and gangrene in 14 (22.07%). Shock was noted in 9 of 28 cases of internal loop strangulation (32.14%), and in six of 13 excluded medium loops (46.1%). No exact data are available for external loops. On the author's unit, shock was not a marked feature in external herniae, the majority of which were inguinal.

In two out of 19 fatal cases, death would appear to have been due to cardio-vascular disease with gangrene of the bowel not associated with surgical shock, and in which toxaemia rather than peritonitis was the local lethal factor. In another two cases late post-operative thrombosis, following an earlier operation for mechanical obstruction, associated more with toxaemia than shock or peritonitis would appear to have been the cause. In two cases, both of which were operated on by the author, the patients died shortly after a medium

loop resection for gangrene, though shock appeared to be under control and peritonitis was not present. Two patients with small bowel volvulus died of peritonitis. One patient developed gangrene which was preceded by shock due to gastro-enteritis. Two other patients with gangrene died, though the exact role of shock, toxaemia and peritonitis was not clear. Of the remaining eight fatal cases, death followed proximal distension without gangrene in seven, and in one death was due to an anaesthetic accident.

iii. *Short Loops.* Here death follows either a local tension perforation with peritonitis, or secondary shock associated with proximal distension and vomiting.

We had ten short loop strangulations, with tension perforation in two. There was one death from gross distension.

6. *The Role of the Peritoneum.* In a previous paper (Hamman and Alldis, 1950) the author classified strangulations into, (a) Intraperitoneal (internal); (b) External (external herniae); and (c) Excluded (intussusceptions). In intussusceptions the strangulated segment, though intra-abdominal, is excluded from the general peritoneal cavity. There is ample evidence to support such a classification. Moses (1949) points out that shock for example, is less marked in inguinal herniae owing to the fact that the size of the sac allows of less capillary seepage and less shock. On the other hand, in internal torsions the greater potential space allows of progressive torsion and long loop lesions with considerable shock. In intussusception progressive strangulation is a feature, and though the segment is excluded, since strangulation takes precedence over luminal occlusion, there is loss of fluid through the lumen with considerable shock at times. It is apparent, too, that both toxaemia and the risk of general peritonitis are most marked in internal loops, less so in excluded loops, and least in external loops. One would expect then, that shock would be greater in internal and excluded loops than in external loops, and that vascular insufficiency and in consequence, the mortality, of cases of internal loops would exceed that of excluded loops. The mortality for the latter would in turn be greater than that noted for external loops. These contentions are supported by the following analysis of our cases in terms of their peritoneal relationships.

	Internal Loops	*Excluded Loops*	*External Loops*
Mortality	21 of 35 (60%)	2 of 14 (14·2%)	3 of 45 (6·66%)
Operative Mortality..	15 of 29 (51·7%)	1 of 13 (7·69%)	2 of 44 (4·55%)
Vascular Insufficiency	29 of 35 (82·85%)	10 of 14 (71·4%)	21 of 45 (46·66%)
Gangrene	19 of 35 (54·28%)	1 of 14 (7·1%)	5 of 45 (11·1%)
Shock..	16 of 35 (45·7%)	7 of 14 (50%)	— About 5%

Note.—Gangrene did not lead to death in excluded and external loops, and shock in such loops was only irreversible when proximal distension was of long standing. This is the opposite of what was found in internal strangulations.

7. *The Mortality from Strangulation.* Though some low figures are recorded (e.g. Eliason and Welty with 12% in 1947) the overall mortality rate for strangulation is yet in the region of 20% to 40% (Nemir *et al.*, 1949). When resection is necessary the rate may be as high as 56%. Our mortality was on the high side. The incidence of gangrene was high, and cases were on the whole seen late. A number of patients were in a moribund condition when admitted. Our total mortality was 27.65%, and our operative mortality 20.9%. Gangrene occurred in 16 of 26 deaths (61.5%).

Internal Loops. The mortality rate is high. Evans and Bigger (1947) had 10 deaths in 16 internal torsions (62.5%). Essenson and Ginzberg cite Hinton *et al.* (1942) to the effect that the mortality for sigmoid volvulus is from 30-45%. The figures cited by Whittaker and Pemberton (1938), Saltzstein (1948), and Laufman and Scheinberg (1942) for the mortality rates in connexion with mesenteric vascular occlusion are all high. Our mortality for internal strangulation was 61.7%, the operative mortality rate was 51.7%. Internal strangulation was responsible for 21 of 26 deaths (80.7%).

Excluded Loops. While high mortalities have been cited for intussusception, the outlook is good when patients are seen within the first twenty-four hours (Macnab, 1949). We had only one death following operation in an infant seen on the fourth day of illness, while a second death occurred in an infant admitted in a moribund condition on the fourth day of illness who was not operated on.

External Loops. Most of our cases were inguinal hernial strangulations, the outlook for which is good. Eliason and Welty noted a five per cent mortality for this condition. In our series the total mortality was 6.66%, the operative mortality 4.55%. It is noted, however, that the rule that external loops offer a good prognosis does not apply to femoral and obturator herniae. Eliason and Welty (1947) cite a mortality of 31% for strangulated femoral herniae, while Jarboe and Pratt (1947) mention a rate of 62.5% when resection is indicated. Desmond and Hutter (1948) note a mortality of 37% to 40% for strangulated obturator herniae. It may well be that delay, which affects the prognosis very adversely in strangulation, has been responsible for these high mortalities.

SUMMARY AND CONCLUSIONS

1. Ninety-four cases of strangulation of bowel are reviewed. These were encountered during a consecutive series of 152 cases of acute intestinal occlusion proved by surgery or post-mortem examination at the Coronation Hospital. The incidence of strangulation was 61.8%. The total mortality rate was 27.65%, the operative mortality 20.9%.

2. The incidence, etiology, and pathology of strangulation is reviewed, with particular regard to the causes for the failure of collateral vessels to provide an alternative circulation following vascular occlusion, and the role of shock and toxaemia in fatal cases.

3. Though in some centres the mortality for intestinal occlusion has been reduced to single figures, the death rate from strangulation is yet in the region of 20-40%.

I have to thank Dr. V. D. Gordon, medical superintendent, for permission to publish this paper, and the senior staff of the Coronation Hospital for permission to make use of cases from wards other than my own.

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MEDICO-LEGAL SECTION

MEDICAL EVIDENCE, REPORTS AND INTOXICATION

In the Supreme Court of South Africa (Cape of Good Hope Provincial Division)

J. G. THEUNISSEN *versus* REX

5 August 1948

De Villiers, A.J.P.: In this matter the accused was charged with a contravention of section 48 (1) (*b*) of Ordinance 15 of 1938, as amended, in that he was guilty of driving a motor-car while under the influence of liquor. He was also charged with contravening section 45 (1) (*a*) of the same Ordinance in that, having been involved in a collision with another car, he wrongfully and unlawfully failed to stop his motor-car immediately. The accused was found guilty on both counts. On the first count he was sentenced to imprisonment for one month with hard labour, and his driving licence was suspended for six months. On the second count he was fined £10, or seven days. An appeal has been noted against both these convictions.

With regard to the second conviction, it is clear on the evidence that, in terms of the relative sub-section of the Ordinance, he did not stop immediately. He apparently proceeded for something like 500 to 600 yards before he returned to the scene of the accident. Mr. Cohen, for the appellant, has abandoned the appeal in respect of this count, and consequently the conviction and sentence on count (2) will be confirmed, i.e. the fine of £10, or seven days' imprisonment with hard labour.

On the first count on which he was found guilty, the evidence is to this effect, that round about 7 o'clock on the evening of 19 December 1947, one Joffe was driving his motor lorry on de Waal Drive in the neighbourhood of the Zoo in Rondebosch. He was travelling from Cape Town to Wynberg, and he was overtaken by the accused. According to the complainant there was no other traffic on the road at the time. As the accused passed him, he apparently swung in too quickly with the result that the left back mudguard of his car came into collision with the right front mudguard of the complainant's car, causing considerable damage to it and incidentally causing him to be diverted from his course, with the result that he hit a tree. Now, the accused

went on for about 500 yards and eventually came back and was there when the police arrived on the scene. On the issue as to whether the accused was driving under the influence of liquor—he is not charged with the alternative of negligent driving—the complainant takes the matter no further, and that is what the magistrate found. The magistrate, however, relies in the course of a detailed judgment, entirely on the medical evidence led.

The medical evidence was led in this way. A certain Dr. Truter, who was acting as District Surgeon at Wynberg, gave evidence very briefly to this effect: that at 7.55 that evening he examined the accused at the Police Station. From his examination he came to the conclusion that the accused was under the influence of liquor and that his driving faculties were impaired. He prepared a report, which he handed in. Now, this is a stereotyped report which provides the material for the examination by doctors of persons alleged to be drunk or under the influence of liquor. No objection was taken to the handing in of this report, so strictly speaking that was in order, but it should be borne in mind that that is the wrong procedure to adopt, and it is certainly undesirable, as the report makes it clear in a footnote that it is not meant to be put in at trials or preliminary examinations but is merely a guide to medical men when conducting examinations, and it may be referred to by the medical officer for the purpose of refreshing his memory. In other words, it is a most useful form of report that a doctor should fill in when examining people charged with being under the influence of liquor, because it sets out what medically are matters of importance in determining whether a person is under the influence of liquor or not. But if that report goes on without its contents being elucidated in any way, it is of no real value to a magistrate or indeed a judge, and the result is, if it merely goes in and nothing more is said about it, it may mean very little.

For instance, in this report the physique of the person is recorded, but for what reason I am unable to tell; then the pulse rate is set out, and the condition of the pupils; the MacEwen's sign, whatever that may be, also the Romberg sign, whatever that may be; also appearances with regard to the conjunctivae, whether normal or injected. Well, the magistrates would not know, and I do not blame them, perhaps judges would not know what conjunctivae are unless explained. Then the face is described, whether it is flushed or pale. All these matters may be of the greatest assistance if they are explained to the Court, but if they are left at that without any explanation, they are of no value, because the layman or a judicial officer does not know what the ordinary pulse rate should be, and why it differs from what it should be. Now, that is all that happened in chief.

In cross-examination, the attorney for the defence in my view was quite obviously cross-examining on that document. Dealing for instance with the pulse rate, the doctor said that the normal pulse rate was 75 to 80; arrest and excitement he said would increase the pulse rate. So that takes that point no further. And then he said some people have flushed or pale faces when they are under the influence of liquor. In this case the report had said 'pale'. Then the doctor said the fact of an arrest could make a man pale. The extremities had also been described as moist, and he said that that could be attributed also to excitement. He goes on to say that the Romberg sign is more marked when a man is under the influence of liquor, but he does not say what the Romberg sign is. He said the hand movements were poor in the accused's case, and he went on to say that a car crash would tend to affect the hand movements. Well, the accused had had a serious crash. Then there is another test, an orientation test, and the responses of the accused apparently had been only moderate. The doctor admits that he has no recollection of what questions he asked the accused in the orientation test. The next test was a memory test, in which he described his memory as indefinite. He then, according to the original record, says: 'Nor can I remember what tests I made in regard to the memory test.' The next one was an arithmetical test, the answers to which were 'moderate'. All he says is: 'I asked accused fairly simple questions.' So whatever he may have said in the report, insofar as he was cross-examined about it, was watered down by him very considerably. Now, that of course is his opinion. He had not seen the accused in the act of driving a motor-car, but he was entitled on his examination to express an opinion.

In my opinion, and that is borne out by authority, he could have deposed to the facts which he had found and upon which he relied as the foundation for the opinion, but an opinion, unaccompanied by the foundation upon which it is based, is again of no value to the judicial officer who has to make a finding on it. The magistrate, however, has quite clearly taken the view that once a medical man has expressed an opinion, the *onus* is on the defence to prove that it is wrong, in other words, in this particular case the magistrate seems to have thought that as the doctor's opinion was that the accused was incapable of driving a car on the evening in question, therefore, unless the defence disproved that opinion, he had no option but to find the accused guilty.

Of course, that is a completely wrong approach to the question. It is for him to base his findings upon opinions properly brought forward and based upon foundations which justified the formation of the opinion. He goes on to deal with a number of these matters set out in Exhibit A—this medical report to which I have already referred—and bases upon extracts from it which were not elucidated at all, facts confirmatory of the opinion formed by the doctor. In my opinion that was an incorrect way to approach the position. He winds up his finding, or his reason for accepting the doctor's opinion that the man was under the influence of liquor to such an extent as to impair his driving faculties, by saying:

'The defence contended also that the doctor was merely giving an opinion as to the accused's condition, but it must be borne in mind that it is the opinion of a professional man and is expert evidence. Unless the defence can show good cause or grounds for not accepting such opinion, the Court must be guided by

that opinion. In this matter the accused was unable to show such cause or grounds, and I accordingly accepted the evidence and conclusions of the doctor.'

I have already indicated that in my opinion that is quite the wrong approach, particularly as there was evidence of laymen who could have said whether, in their view, the man appeared to be under the influence of liquor. The complainant did not suggest it, and neither did the two policemen to any material extent, and that, indeed, the magistrate found. In my opinion, therefore, he was not justified in coming to a conclusion that the accused was under the influence of liquor in terms of the section merely upon this medical evidence, which admittedly is what he based his decision upon.

For these reasons the appeal on count (1) must be allowed, and the conviction and sentence set aside. On count (2) the conviction is confirmed, as also is the sentence.

Steyn, J.: I agree.

NEW PREPARATIONS AND APPLIANCES

MOTION SICKNESS: AVOMINE

Pharmaceutical Specialities (May & Baker) Ltd. announce the introduction of 'Avomine' brand promethazine-8-chlorotheophyllinate for prescription by the medical profession in the symptomatic control of nausea and vomiting, especially in travel sickness. This product will be available early in 1951. In the recommended doses, it is suitable for administration to children, and it has been found useful for those travelling during the early stages of pregnancy. It is likely to be of value in the symptomatic treatment of other conditions in which nausea and vomiting are troublesome symptoms.

In large-scale clinical trials in sea-sickness, very appreciable benefit has been obtained in a high proportion of cases. These trials have also demonstrated that 'Avomine' is free from undesirable side-effects. The following dosage scheme has been found to be generally suitable for adults:

Prevention: One 25 mg. tablet each evening at bed time, treatment commencing the night before travelling. A second dose during the 24 hours is seldom needed.

Treatment: One 25 mg. tablet taken as soon as possible and repeated the same evening. No dietary restrictions need be imposed.

Patients can be encouraged to get up and about as soon as they feel able to do so. Continued treatment, as described under prevention, may be required. A total of four tablets in 24 hours may safely be given if necessary.

Children between five and 10 years of age may be given half the adult dose; those over 10 may be given the adult dose. Children under five are probably best treated with 'Anthisan' or 'Phenergan' elixirs.

There are no absolute contra-indications to the use of 'Avomine'. Dosage should be carefully supervised in those patients taking barbiturates, since the central sedative effects of the two types of drug are synergistic. Following the first dose of 'Avomine' it is also advised that an individual should not be in charge of machinery or mechanical vehicles until it has been established that his reaction to 'Avomine' is the normal one.

'Avomine' is available in containers of 10 x 25 mg. tablets.

ASSOCIATION NEWS : VERENIGINGSNUUS

BARAGWANATH MEDICAL SOCIETY: OCTOBER MEETING

Mr. G. R. Crawshaw, thoracic surgeon, presented the radiographs of a female patient aged 26, who was admitted to the hospital with a complaint of cough and pain in the left side of the chest. She had a short febrile period with response to penicillin. X-ray showed a large pleural effusion on the left side which on aspiration proved to be a straw-coloured, sterile fluid containing a few lymphocytes. Examination of the sputum, bronchial swabs and the pleural fluid for tubercle bacilli were negative repeatedly. The blood count revealed an eosinophilia of 20%. The effusion disappeared rapidly over a period of 4-6 weeks and bronchograms done subsequently showed well-marked bronchiectatic changes in the left lower lobe. Bronchoscopy showed compression of the stem bronchus to the lower lobe on the left. Pulmonary angiograms of the affected lobe after catheterization showed a normal pattern, but rather small vessels.

The case was presented for diagnosis. It had been accepted clinically at first as a tuberculous effusion but the rapid course, apparent response to penicillin and failure to find the organism cast some doubt.

Mr. L. Fatti asked whether the appearance of the bronchiectasis in the left lower lobe was not compatible with the reversible type of change one may see in an expanding lobe which has been atelectatic. The brochoscopic appearance of compression of the bronchus would fit in with a hilar adenitis causing absorption collapse of the lobe.

Speakers considered tuberculosis the most likely underlying disease.

Mr. Crawshaw said examinations of the stool and urine in this case had failed to reveal any evidence of parasitic infestation. He felt that tuberculosis was not excluded completely and if Mr. Fatti's interpretation of the bronchograms were accepted, a late primary infection with large hilar glands could be the cause. The apparent response to penicillin remained unexplained. Further bronchograms and intensified search for the tubercle bacillus are proposed.

Mr. Crawshaw then showed the radiographs and bronchograms of four patients treated recently in the Thoracic Surgical Unit, all of whom presented with a putrid, foul-smelling empyema. He pointed out that in the large number of cases of lung abscess seen at Baragwanath Hospital the usual course was towards resolution provided adequate measures were taken to promote drainage and combat infection. Most formed pleural adhesions, and empyema due to rupture was uncommon.

Case 1. A large right middle lobe abscess which ruptured and produced a pyopneumothorax with thin, foul-smelling pus. Rib resection under local anaesthesia was performed and the remains of the middle lobe sloughed leaving a large bronchopleural fistula. There were no adhesions. Gross mediastinal flutter was controlled by an occlusive vaseline gauze dressing over a large tube. In 24 hours the mediastinum was stabilized. The fistula closed in 10 days. There was complete healing in 10 weeks. A bronchogram now shows a normal bronchial tree, except for absence of the middle lobe system, and full expansion of the remaining lobes.

Case 2. Aspiration of a putrid empyema uncovered a small peripheral abscess in the left lower lobe. Early drainage by rib resection of the empyema was performed. This resulted in a small bronchopleural fistula. Healing was rapid and complete in six weeks. There remained a small residual abscess on bronchogram.

Case 3. A patient with a right-sided pyopneumothorax with thin, foul-smelling pus. Early rib resection was performed. There were few adhesions and mediastinal flutter was controlled as in Case 1. No fistula was found but a granulating flat area at the apex of the lower lobe was felt at operation. Healing was complete in three months with a normal bronchogram.

Case 4. Another case of pyo-pneumothorax was treated with early rib resection. Healing was rapid and the bronchogram presented normal features.

Mr. Crawshaw stressed the desirability of early rib resection in these cases, who were extremely ill patients, and the rapid healing which followed. It was essential to perform the operation under local anaesthesia with the patient in the sitting position and with adequate facilities for controlling the gross mechanical disturbance which ensued on the creation, even temporarily, of an open pneumothorax. Given these facilities, the patients improved rapidly and the mediastinum would stabilize rapidly and enable the treatment to be carried on as for any other open drainage of an empyema, but without the protracted course and frequent complications of a chronic empyema with gross pleural thickening. Intercostal drainage was often unsatisfactory in that the tube easily became blocked by flakes of fibrin and, in any case, was in effect open drainage

after 48 hours due to leakage around the tube. Rib resection had to be performed eventually and done early avoided the added risk of cellulitis of the chest wall.

Mr. A. Lee McGregor said empyema is rare nowadays in European practice. He had seen similar cases to these described in Negro patients in America. He wondered why the effect of early drainage of thin empyemata in the influenza epidemic in 1919 was so uniformly bad compared with these results.

Mr. L. Fatti felt that early open drainage on the lines Mr. Crawshaw had advocated should only be carried out in the Thoracic Surgical Unit and with the strict precautions he had mentioned.

Dr. L. Hirshowitz presented a case of an adult Bantu male who received a gunshot wound three months ago, the bullet entering the face just below the left eye. He complained of pain below the left eye, difficulty in walking and dimness of vision in the left eye. The fundus on the left showed a vitreous haze and a retino-choroiditis confined to the inferior segment. In addition, the corneal reflex was absent on the left. There was complete loss of all forms of sensation in the area supplied by the trigeminal nerve. The masseter and temporal muscles on the left were markedly atrophied. There was a complete lower motor neurone lesion of the left facial nerve and loss of sensation of the anterior two-thirds of the tongue. There was a nerve deafness on the left side.

The patient had a definite ataxia in the left arm and leg associated with loss of tonus. There were no other sensory disturbances but the patient showed all the signs of cerebellar dysfunction on the left side, with a definite tendence to reel to the left when walking. Lumbar puncture was normal but roentgengrams of the skull showed the bullet to be lying in the posterior fossa on the right side. Encephalographic studies showed no abnormality.

Dr. Hirshowitz discussed various aspects of the case. It was thought that the bullet entered the orbit and was deflected off the occipital bone to lie eventually in the posterior fossa on the right side. Blindness was attributed to the traumatic retino-choroiditis. He traced the course that the bullet had taken. This he thought to be a horizontal plane and severing the fifth, seventh and eighth nerves with some injury in the brachium pontis. A peculiar symptom was pain in the distribution of the fifth nerve in the presence of complete anaesthesia, a type of anaesthesia dolorosa.

Mr. Lee McGregor suggested that the pain was due to an irritative lesion of the maxillary branch, possibly a neuritis.

COPY OF A CIRCULAR SENT OUT BY THE SECRETARY FOR JUSTICE *re* THE STATUS OF INTERNS

1. Attention is drawn to the amendment of Act No. 13 of 1928 (Medical, Dental and Pharmacy Act) by Act No. 13 of 1950, promulgated in the *Extraordinary Government Gazette* No. 4352 of 24 March 1950, whereby a new class of medical personnel is created.

2. All newly qualified medical graduates will in future be compelled to serve in an approved hospital for a period of one year before being registered as medical practitioners and will be called *Interns*.

3. It is permissible for an intern to describe himself as in possession of a registrable medical degree and registered as an intern, and it is suggested that this description be adopted in legal records.

4. Although the registration of the intern as a medical practitioner is deferred for a period of one year, he is in possession of the full academical qualifications of a registered medical practitioner. He is, therefore, in a court of law, as qualified to offer an opinion, or to give evidence on a question of medical science, as he would be if registered as a medical practitioner.

5. Interns in the employ of the Union Government or the various Provincial Administrations, when called as witnesses in criminal proceedings, should be classified as Public Servants for the purpose of payment of witness fees and travelling expenses. Where they are, however, employed by private institutions, the fees prescribed for medical practitioners are applicable.

6. This Circular is issued with the concurrence of the Department of Native Affairs.

PASSING EVENTS

Dr. Douglas Guthrie, a Fellow of the Royal Society of Medicine and for the last five years Professor of History of Medicine in Edinburgh, will be visiting South Africa in order to deliver lectures at various Universities.

He will arrive in Cape Town during January on the *Stirling Castle* and plans to return to England via Egypt in April.

Dr. Guthrie is also the author of a volume entitled *The History of Medicine*.

* * * *

Dr. Grantly Dick Read has been appointed an Honorary Lecturer attached to the Department of Philosophy, Science Section, University of the Witwatersrand, Johannesburg.

* * * *

At the 78th Annual Meeting of the American Public Health Association Dr. H. Most of the Departments of Preventive Medicine and Medicine, New York University-Bellevue Medical Centre, reported that Terramycin had proved completely effective in the treatment of amoebiasis for six months after treatment was stopped.

* * * *

At the Meeting of the American Institute of Chemical Engineers held in New York on 24 October two new antibiotics, which may have industrial as well as therapeutic uses, were announced. These are Netropsin and Thiolutin and follow by only a few months the Pfizer Company's report of the discovery and development of Terramycin and Viomycin which is now being tested clinically as a specific agent in combating tuberculosis. Netropsin has shown great promise as an insecticide, particularly against clothes moths and carpet beetles, two of the most destructive insect pests, and Thiolutin may be effective in combating fungi.

* * * *

Dr. F. J. Vinter, Technical Secretary of the Universities Federation for Animal Welfare, of 284 Regent's Park Road, Finchley, London N.3, England, would like to receive information and suggestions about the following subjects with the object of improving the UFAW Handbook on the Care and Management of Laboratory Animals, edited by Prof. A. N. Worden:—

The training of animal technicians, animal houses and animal rooms, rabbits, guinea-pigs, rats, mice, voles, hamsters, hedgehogs, ferrets, frogs, and other amphibians, fish, anthropoids, dogs, cats, goats, poultry, canaries, pigeons, or any other species of animals used for scientific purposes.

Subject matter can be conveniently forwarded grouped under the headings of anaesthesia, euthanasia, supply and breeding, feeding and watering, general management and hygiene, transport by sea, land and air, animal behaviour and psychology.

* * * *

Dr. C. A. R. Schulenburg of Pretoria leaves towards the end of December by air for a two months' visit to London, New York and Boston to visit surgical clinics. He will be accompanied by his wife.

MEDICAL NAME-PLATES

The attention of medical practitioners is drawn to the following rule regarding conduct of which the South African Medical and Dental Council may take cognizance:—

1. Using any of the following means to indicate his place or residence or consulting rooms:—

(a) A name-plate exceeding in size 14 by 8 inches or otherwise not complying with the requirements hereinafter laid down.

(b) A street signboard.

(c) A name-plate or lettering on balconies or windows.

(d) A name-plate on an outside wall or pillar forming part of a building not a *bona fide* entrance to that part of the building in which his consulting room is situated without the special permission of the Council.

Notes:

i. Plain name-plates such as are in general use by the profession must be used. A name-plate shall not contain more than the practitioner's name, title, profession, qualification or degree, his speciality, if any, if it has been registered by the Council, his telephone number(s) and his hours of consultation. The use of the term 'American Dentist' or similar title is not allowed.

ii. Not more than one name-plate at each entrance to a

building and one on the door of the consulting room shall be allowed.

iii. In the case of occupants of large buildings where special provision is made in the entrance hall and on the various floors to indicate the tenants, it shall be permissible to make use of such provision.

iv. If necessary, in large buildings, a name-plate with the name of the practitioner only may be used in the corridor for the direction of patients.

v. In the case of practitioners succeeding to a practice or in the case of death or retiral of a partner it is not permissible to use on the premises or elsewhere the name or name-plates, or plates of the predecessor, deceased or retired partner for a period exceeding twelve months from the date of succession to the practice. During this period of twelve months succession to the practice shall be indicated by the words 'Successor to'.

vi. In the case of removal, the name and new address of the practitioner may remain in reasonable evidence for a period not exceeding twelve months.

vii. Professional name-plates shall not be allowed at any place unless a practitioner actually resides or *bona fide* practises at such place.

viii. Dentists who are registered under the provisions of section thirty-six of Act No. 13 of 1928, may use the title 'Dentist' or 'Registered Dentist' but no other.

Abbreviations of these titles are not permitted.

REVIEWS OF BOOKS

DIPHTHERIA PROPHYLAXIS

Developments in Diphtheria Prophylaxis. By Lewis B. Holt, M.Sc. (Pp. 181. With 33 graphs and 2 plates. 42s.) London: William Heinamann Ltd. 1950.

Contents: 1. Problems Involved in the Preparation of Diphtheria Prophylactic. 2. Preparation of the Antigen. 3. The Alum Precipitate. 4. Immunological Problems involved in Diphtheria Prophylaxis. 5. An Historical Review of Diphtheria Prophylaxis. 6. A Critical Review of Glenny's Work and his Explanation for the Enhanced Potency of A.P.T. 7. A Reinvestigation on the Enhanced Potency of A.P.T. 8. Some Factors governing the Physiological Activity of Diphtheria Prophylactics. 9. Standardization and Statutory Regulations. 10. An Alternative Explanation for the Enhanced Physiological Activity of Diphtheria A.P.T., P.T.A.P., etc., over their Parent Formol-Toxoids. 11. Complete Technical Details for: The Cultivation of C. diphtheria for Toxin Production, and the Conversion of Toxin to Toxoid; the Purification of the Crude Formol-Toxoid; the Preparation of P.T.A.P. 12. Preparation of the Medium. 13. The Conversion of Toxin to Toxoid. 14. Preliminary Purification of Formol-Toxoid. 15. Concentration and Purification of Toxoid. 16. The Preparation of P.T.A.P.

One of the greatest immunological advances has been the development of diphtheria prophylactics. Everyone is familiar with such immunizing preparations as formol toxoid and alum precipitated toxoid. The latter is most widely used, especially for the immunization of children. Although highly effective when preparations of adequate potency are used, even A.P.T. has certain disadvantages.

Holt has made a detailed study of the preparation and testing of antigens for immunization against diphtheria. His book describes not only the historic and scientific background of the antigens commonly employed, but also goes into particular detail about one he has developed himself, viz., Purified Toxoid Aluminium Phosphate precipitated (PTAP).

P.T.A.P. has, like A.P.T. a greater immunizing potency than simple toxoid and there are other advantages to its use. It is suggested by Dr. Bousfield, who contributes to the book, that the preparation of choice for immunization against diphtheria should contain 20-30 Lf toxoid per c.c., 10 mg. $AlPO_4$ per c.c., should be neutral in reaction and have been stored at room temperature for 3-6 months before use. This claim, is well substantiated by extensive laboratory and field trials recorded in detail.

For those interested in diphtheria immunization, in the methods of preparation of prophylactics, and their methods of evaluation, this book will prove most valuable. It is, perhaps, unfortunate that the author has subdivided the chapters into many small sections, most of which are followed by summaries and discussions which tend to break the continuity. On the other hand such sub-divisions may be of particular value to those interested in the details of the individual experiments described.

X-RAY DIAGNOSIS

A Text-Book of X-ray Diagnosis. By British Authors. Volume IV. Edited by S. Cochrane Shanks, M.D., F.R.C.P., F.F.R., and Peter Kerley, M.D., F.R.C.P., F.F.R., D.M.R.E. (Pp. 574 + xvi. With 553 illustrations. Second edition, 1950. 60s.) London: H. K. Lewis & Company Limited.

Contents: List of Contributors Preface. Summary of Contents. Part 1. The Normal Bones and Joints. Part 2. The General Pathology of Bone. Part 3. Congenital Deformities of Bones and Joints. Part 4. Traumatic Lesions of Bones and Joints. Part 5. Inflammatory Diseases of Bones and Joints. Part 6. Osteochondritis. Part 7. Static and Paralytic Lesions. Part 8. Constitutional Diseases of Bones and Joints. Part 9. Tumours and Cysts. Part 10. The Soft Tissues. Part 11. Localization of Foreign Bodies.

This textbook was originally published in 1939 and it immediately earned a place among the established textbooks. The long-postponed second edition has been worth waiting for. Its contributors are 11 British teachers and it thus provides a representative and authoritative exposition of British thought.

The present edition has all the good features of the original; in particular, the exceptionally high standard of the illustrations has been maintained and many new ones have been added. The text in general is accurate and well balanced with few printer's errors.

The many advances in radiology in the past decade are reflected in the many descriptions of newly evaluated clinico-radiological entities, bringing the work up to date: Among these may be mentioned the following: chemotherapy in osteomyelitis; sarcoidosis; spondylolysis and spondylolisthesis; fatigue fractures; Sudeck's atrophy; fluorine poisoning and osteoid osteoma.

In addition to this new material, the section on traumatic lesions has been trebled in size and this is a valuable improvement; so also is the re-arrangement and expansion of many other sections, particularly that on bone tumours. The index is also greatly improved.

In this paen of justifiable praise it is a pity to have to record that the English is not quite as impeccable as the reader has the right to expect from a British textbook; but the errors are not sufficiently frequent to detract from the pleasure (and instruction) of perusal.

One must challenge the statement (p. 129) that 'the radiologist learns, often subconsciously, the minor variations from the normal in these standard positions', as an important principle of teaching is implied by it, viz. that one can learn the minor variations from the normal without active thought. In this reviewer's opinion and experience, this statement is misleading; for the evaluation of minor variations can be attempted only by those who have observed and considered purposively and actively both the normal and its 'minor variations'.

The subdivision of the original three volumes into four is convenient and will enable specialists in individual fields to possess the material relevant to their specialties. Thus this volume can be highly recommended to orthopaedic and general surgeons, and it can be regarded as essential for radiologists.

GONORRHOEA

La Blennorragie. By Pierre Durel. (Pp. 649. With illustrations. fr. 2,200). Paris: Masson & Cie. 1950.

For the average practitioner, gonorrhoea ceases to hold any interest once the needle, through which he has just injected 300,000 units of procaine penicillin in oil, has been withdrawn. For Dr. Pierre Durel (of the Saint Louis Hospital, Paris), however, it is still a serious ailment fraught with many potential dangers, demanding knowledge of an extensive pathological background and expert acquaintance with a multitude of minute, technical manoeuvres.

In a recent book of 649 pages Dr. Durel carries on the grand tradition of the French School, so brilliantly upheld in other days by Janet and Luys. There are four main divisions of this work. In Part I the morphology and general biology of the gonococcus are ably described, though the long, detailed account of the complement fixation test, which has never firmly established itself as a helpful diagnostic procedure, seems somewhat superfluous.

The taking and the staining of specimens from various sources receive expert attention and the microscopic differential diagnosis is fully considered. The second part of the book is packed with anatomical details, including 50 pages devoted to many types of cervicitis, yet omitting such an important and common complication as arthritis, which is only mentioned once or twice in a casual manner.

The same unbalance reoccurs in Part III, which is devoted to treatment. Penicillin and other antibiotics are discussed in 20 pages while over 100 pages are taken up by meticulous descriptions of surgical procedures and physio-chemical methods for dealing with complications which are now rarely encountered. It seems, indeed, as though the author was determined that no form of treatment would be omitted from his work. The latter part of the book presents a series of interesting clinical and therapeutic problems (for which Dr. Durel has the answers) and briefly expounds French legislation on venereal diseases. The illustrations and diagrams are excellent, though the binding is not and there are quite a few printer's errors scattered throughout the text.

That the author is acquainted with the literature is clear from the abundant references. Dr. Durel pleads for a specialized specialist for what he calls a 'blenorrologist'. The latter should do his own microscopic work for he maintains that 'a blenorrologist without a microscope is as useful as a blind ophthalmologist or a deaf cardiologist'.

Penicillin treatment has reduced the incidence of complications in gonorrhoea to small proportions, so that a lot of the book will appear redundant to the reader. Dr. Durel, however, has not full confidence in the abiding value of this drug. His provocative tests on the urethra with silver nitrate solution will not commend itself to everyone.

This splendid volume is written for the super-specialist, working in a populous country—written in fact for Dr. Durel's 'blennorrologist' especially for that one who is an expert gynaecologist into the bargain.

FRACTURE TREATMENT

The Closed Treatment of Common Fractures. By John Charnley, B.Sc., M.B., F.R.C.S. (Pp. 190 + xi. With 133 figures. 35s.) Edinburgh: E. S. Livingstone. 1950.

Contents: 1. The Mechanics of Conservative Treatment. 2. Joint Movement in Conservative Methods. 3. The Treatment of Fractures without Plaster of Paris. 4. Plaster Technique. 5. Fractures of the Shaft of the Humerus. 6. Supracondylar Fractures of the Humerus in Children 7. Fractures of the Radius and Ulna. 8. The Colles's Fracture. 9. The Bennett's Fracture. 10. On Finger Fractures. 11. Pertrochanteric Fractures of the Neck of the Femur. 12. Fractures of the Shaft of the Femur. 13. Fractures of the Femoral and Tibial Condyles. 14. Fractures of the Shafts of the Tibia and Fibula. 15. The Pott's Fracture. 16. The Walking Caliper. Appendix. Index.

Creeds and hypotheses often come to be believed not because they are rational, but because they are repeated. In this book we have much evidence of original thinking by the author, rather than the almost monotonous repetition of statements which are transmitted from one textbook to the next. If a textbook can be said to serve one particular purpose, then this one certainly accomplishes what the author has set out to do, viz. to demonstrate how much can be achieved by the closed manipulation of fractures.

This book has been written at a singularly appropriate time, as there is a greatly increasing tendency nowadays to perform open operations for the reduction of fractures, many of which could be easily reduced by a skilled manipulator with at least equally good results, and with far less risk to the patient. The author points out that 'the essential difficulty in performing a closed reduction can usually be traced to the surgeon not having a clear mental picture of what he is attempting to do'. This monograph goes a long way towards resolving many of these difficulties and laying down the essential principles upon which the closed treatment of fractures is founded.

The book contains a valuable chapter on the construction of the Thomas splint, and the uses to which it may be put. This may be a revelation to some of the younger surgeons, of whom many have come to consider it as an almost obsolete method of treatment.

This book also contains the author's original ideas on the genesis and treatment of joint stiffness; a similar chapter has also been written by him in *Modern trends in Orthopaedics*. The central theme of this is that 'the commonest single cause of permanent joint stiffness is sepsis; the stiffness caused by the dense scar tissue left by sepsis is irreparable'. This damning statement should cause many who light-heartedly perform open reductions to search their consciences and review their methods. 'A solitary instance of sepsis in any series should be regarded as considerably reducing the merit of the series as a whole'.

Although this book has been written primarily for the young casualty surgeon, it may be read with considerable profit by most surgeons who deal with injuries of the skeletal system. The book can be recommended strongly.

OPHTHALMIC OPERATIONS

Ophthalmic Operations. By Seymour Philps, F.R.C.S. (Pp. 397 + x. With 510 figures. 50.) London: Baillière, Tindall & Cox. 1950.

Contents: 1. General Considerations. 2. Anaesthesia of the Eye and Orbit. 3. Minor Surgery of the Eyelids. 4. Major Surgery of the Eyelids. 5. Reconstruction of the Eyelids. 6. Surgery of the Lacrimal Passages. 7. Conjunctiva. 8. The Surgery of Squint. 9. Corneal Surgery. 10. Corneal Grafting. 11. Iris Surgery. 12. Cataract. 13. Post-Cataract Needling. 14. The Surgery of Glaucoma. 15. Retinal Detachment. 16. Retinal Tumours. 17. Intraocular Foreign Bodies. 18. Removal of the Eye. 19. Operations Upon the Socket. 20 Exploration of the Orbit. Index.

Mr. Seymour Philps is to be congratulated on this new textbook of ophthalmic surgery. It has a special appeal to both the young surgeon commencing practice, and those who have had considerable experience. It has been kept within reasonable dimensions, and is beautifully illustrated. The text type and paper used are of the best, and the author has, by omitting superficial descriptions of several alternative procedures for the same operations, saved the student from getting confused.

One must agree with his statement that before commencing to train as an ophthalmic surgeon, general surgical experience is an essential, in order that confidence in tackling skin grafts and other similar procedures is attained. The chapter on anaesthesia of the eye contains many useful tips, as e.g. the method used to obtain anaesthesia of the lids.

In the chapter on Squint, the suggestion that silk and not catgut sutures be used for fixing the muscles is both safe and sound, as silk knots remain knotted and do not swell and become untied as may happen with catgut.

In the chapter on Cataract, the author only advises the use of a corneo-scleral stitch in cases of intracapsular extraction and does not deem it necessary in the extracapsular method. This reviewer is of the opinion that sutures should be used as a routine in both types of cataract operation, and feels that the method of using a keratome and enlarging the incision with scissors should be mentioned for the benefit of surgeons starting on ophthalmic work.

Mr. Philps is to be congratulated on this excellent work which is confidently recommended to all ophthalmic surgeons.

CORRESPONDENCE

DOCTOR-PATIENT RELATIONSHIP UNDER A SYSTEM OF SOCIAL MEDICINE

To the Editor: 'The proper study of mankind is man.' Ideal general medical practice pre-eminently demands such study. In one of two papers on general practice in a recent *Journal* Professor Brock observes that first-year medical students tend to aim at general practice. The fascinating prospect of such study no doubt attracts them to it. Dr. Meiring suggests multiple partnership as a plan for the efficient running of a general practice. It certainly would, if properly carried out, help to make ideal general practice possible. Unfortunately, as that writer points out, such partnerships seem to be short-lived, as are also, in Professor Brock's experience, the aspirations towards general practice of medical students.

Ideal general practice demands, first and foremost, an intimate doctor-patient relationship. The doctor should be guide, philosopher and friend to his patients and their families in all matters pertaining to health and happiness. He should be able to advise not only how to cure disease but also how to maintain positive health by sane and healthy living. The patient, in turn, should have implicit confidence in his doctor.

Such confidence still exists but, unfortunately, is not as common as of yore.

The general practitioner should be the director of operations against disease in his patients. He has, as family doctor, an intimate knowledge of the patient's history, family relationships and environment. He is not an expert in any of the specialties but must know at once to which specialist he must refer his patient when necessary. He never loses sight of the wood for the trees. He is a specialist in the human relationships of his patients. Such a specialist is the natural leader of a team of multiple partners as was mentioned in the second paper referred to. Unfortunately, as mentioned by Dr. Meiring, such partnerships seldom last. Yet among hospital residents and honoraries just such teams work well and amicably together. Can the sinister worship of the yellow god of Mammon mar the harmony that should exist among the partners? Can a similar explanation be given for the short-lived enthusiasm of medical students who, only too frequently, aim at specialization even before they are qualified? In part at least it would appear so, but the modern drive to establish, with perhaps rather indecent haste, some form of social medicine cannot be wholly exonerated.

'The object of social medicine may be described as the equalization of classes, rich and poor, in respect to health.' To effect such equality arrangements must be made whereby every person, irrespective of wealth or social position, shall be given every care that professional skill and institutional treatment can provide for whatever sickness he suffers from. The work of the general practitioner and his team is an extensive and expensive matter. The poor can never and the middle class can seldom pay full fees. They must be subsidized, but subsidizing in health matters carries the same risk as did the raising of the status of the working classes in the latter half of the last century.

In his fascinating history entitled 'English Saga 1840-1940' Bryant traces clearly the effects of the Industrial Revolution and the fulfilment of Goldsmith's forecast,

Ill fares the land, to hastening ills a prey,
Where wealth accumulates and men decay.

He describes the struggle between the two greatest statesmen of that time, Gladstone and Disraeli. Both were men of high Christian principle. The former took the shorter, the latter the longer view of the reforms required to eradicate the evil wrought by the *laissez-faire* policy of the Free Traders who made fortunes through the virtual enslavement of the working classes. Both espoused the cause of extension of the franchise, but while Disraeli maintained that every extra privilege should carry with it an extra duty, Gladstone pushed for the *immediate* amelioration of the working people's lot by carrying out his policy of 'a free breakfast table'. His success just failed to achieve disaster in the country, nearly succeeding in starving out the island home of his people in 1917. The two policies were not incompatible. Immediate relief was necessary but did not preclude the inculcation of a sense of duty to their country in those who benefited.

So, now, in the sphere of health legislation. Social medicine not only demands immediate provision of the very best that science knows for the fighting of disease and the establishing of positive health among *all* classes, but also legislation to impress on the beneficiaries their duty to make the scheme work. Hitherto, legislation has been conspicuously deficient in the second requisite. Hence the present overcrowding of hospitals (and the threat of a strike by 20,000 British doctors). No doubt this is a legacy from the earliest attempts to bring medical services within the means of the poorer classes, which took the form of Sick Clubs to which all members of the club paid a flat rate, often 2d. per week for all services rendered by the medical officer of the club. One doctor attended all workmen and their families in the works and received remuneration at a fixed rate per member per annum. That is the very worst form of social medicine and is known as a 'closed panel', for in that form there is absolutely no free choice of doctor by the patient.

Naturally, such a system makes the doctor-patient relationship absolutely impossible. An inferiority complex enters into the picture. The patient feels that as he has no choice of doctor and the doctor receives a flat rate of pay no matter how much or how little he does for his patient, he must *ipso facto* do the most slipshod work that he can get away with. The result is that the patient tries to 'get his money's worth out of the sick fund' by haunting the doctor's consulting rooms and demanding treatment for the most trivial complaints, and prescriptions for medicines which he himself fancies will do him good (e.g. aspirin and castor oil). The result is an overcrowding of the consulting rooms, and hospitals too when these are provided under the sick-fund scheme. Most conscientious doctors, when faced with such overcrowding of their rooms, try to spot the really sick people and give them a thorough examination while he gets rid of the rest with some placebo. Even that, however, eats into his time and temper to such an extent that he generally resigns. The richest and wealthiest sick fund in the Union is of this closed panel pattern and because it is Union-wide it cannot be incorporated into any of the Provincial Sick Benefit schemes because that would involve a change in one of the entrenched clauses of the South Africa Act. Less bad are clubs where there are several doctors on the panel but even these do not give free choice of doctor unless every doctor within reasonable distance of each patient in the club is on the panel. Medical aid societies are a distinct improvement on the others for they give free choice of doctor and the doctor gives his services at a reduced fee in consideration of the fact that the society collects the fees and pays the doctors who therefore incur no bad debts. Even so the patient realizes that he is treated at lower rates than private patients and so does the doctor. Furthermore, such medical aid societies can hardly, in the nature of things, become nation-wide unless the scheme suggested below can be classed as a glorified medical aid society on a national scale.

Such inferiority complex would, of necessity, be completely eliminated if neither the practitioner knew what the patient paid for his services nor the patient knew what the practitioner received for his work. No accounts would be sent out but a statement of work done would be sent to the national bookkeepers, who would most naturally be the bankers, and deductions from the accounts of the patients would be made in proportion to their means. The practitioners would be paid at fair rates in accordance with the work done. True doctor-patient relationship would be preserved and there would be absolute equality of rich and poor in respect to health. Doctors would be provided with transport to and from their patients by the same national bookkeepers as well as with instruments, medical centres in which to interview those able to visit their doctors, and hospitals in which to treat those too ill to be left at home. There would certainly not be enough money from medical fees to pay for all this so the balance would have to be drawn from the National Credit which depends on the wealth of the nation as a whole. That National Credit would be derived from the bank balances of its nationals which would be put at the disposal of the government *free of interest* in return for the government's protection of the interests of *all* its citizens and business concerns in times of danger when the banks have always whined to the government for a moratorium to preserve them from bankruptcy. In return for these moratoria it has kindly lent vast sums and charged handsome interest to the government that saved them. Under the new system they would be deprived of the power to create credit and thereby produce inflation and deflation in turn and drive governments to the robbery of devaluation of the currency and charge interest, but to balance their loss of revenue from that source (which they should never have had), they would be paid adequately for their duties as national bookkeepers. Their function in that capacity could be extended most usefully to all professions and businesses whose assets that were not in use would all go to swell the national credit from which all public expenditure would be provided. Those with large amounts deposited in national credit would be able to draw proportionately large sums; those with very little or nothing in it would be allowed to draw only sufficient for their necessary living expenses so that nobody would live in extreme poverty, yet they would not be pauperized, for nobody would know except the bankers (to whom they would be just names) so that their reputations would in no way suffer.

If members of national, provincial and municipal councils were similarly remunerated we might have a more satisfactory type of candidate than we have at present.

Crawford Lundie.

139, Manning Road,
Durban.
13 November 1950.